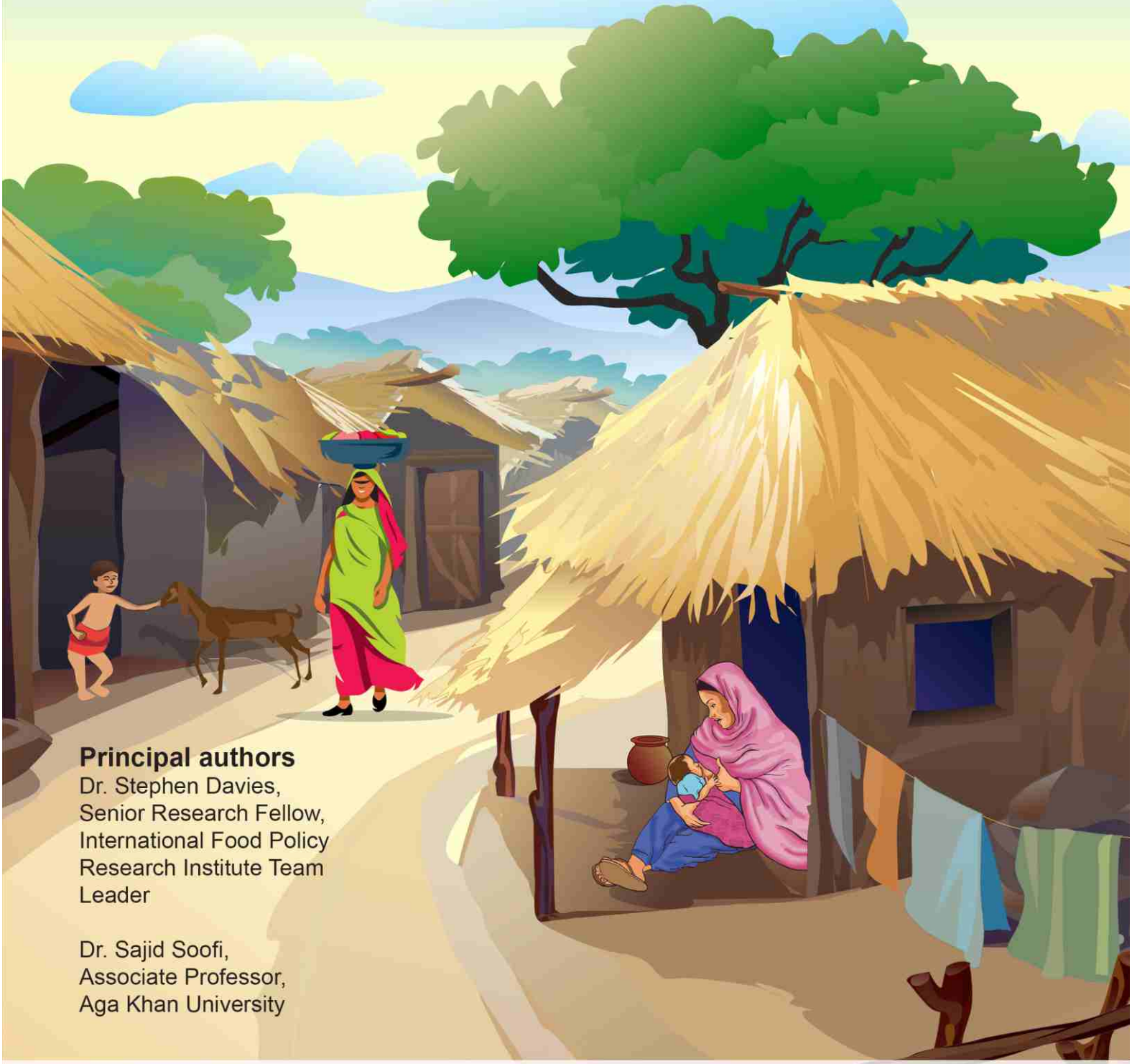
Stratigic Review of Food Security and Nutrition in Pakistan



Principal authors

Dr. Stephen Davies,
Senior Research Fellow,
International Food Policy
Research Institute Team
Leader

Dr. Sajid Soofi,
Associate Professor,
Aga Khan University

UNITED NATIONS

A Strategic Review of Food Security and Nutrition
(Final Report)

Submitted to the Economic Affairs Division, Government of Pakistan

and the UN Strategic Review Advisory Group

by

The Aga Khan University & The International Food Policy Research Institute

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ABBREVIATIONS

ADB	Asian Development Bank
AJK	Azad Jammu and Kashmir
AKU	Agha Khan University
ANC	Antenatal Care
BCC	Behavior Change Communication
BHU	Basic Health Units
BISP	Benazir Income Support Program
BMI	Body Mass Index
CMAM	Community Management of Acute Malnutrition
CPEC	China Pakistan Economic Corridor
DALY	Disability Adjusted Life Years
DDMA	District Disaster Management Authority
DFID	Department for International Development
DHIS	District Health Information System
EAD	Economic Affairs Division
FANA	Federally Administered Northern Areas
FAO	Food and Agriculture Organization
FATA	Federally Administered Tribal Areas
FDIHS	FATA Development Indicator Household Survey
FY	Fiscal Year
GB	Gilgit-Baltistan
GDP	Gross Domestic Product
GoP	Government of Pakistan
HIES	Household Integrated Economic Survey
ICESCR	International Covenant on Economic Social and Cultural Rights
IDD	Iodine Deficiency Disorder
IFA	Iron Folic Acid
IFPRI	International Food Policy Research Institute
IMF	International Monetary Fund
IMR	Infant Mortality Rate
IRMNCH	Integrated Reproductive, Maternal and Child Health
ITPE	Independent Third Party Evaluation
IYCF	Infant and Young Child Feeding Practices
KP	Khyber Pakhtunkhwa
LHW	Lady Health Workers
M&E	Monitoring and Evaluation
MAD	minimum acceptable diet
MAM	Moderate Acute Malnutrition
MDGs	Millennium Development Goals
MICS	Multiple Indicator Cluster Survey
MMR	Maternal Mortality Rate
MNCH	Maternal, newborn, and child health
MoU	Memorandum of Understanding

MoPDR	Ministry of Planning, Development and Reforms
MPI	Multidimensional Poverty Index
MSNS	Multi Sectoral Nutrition Strategy
NDMA	National Disaster Management Authority
NFC	National Finance Commission
NGO	Non-Governmental Organization
NI	Nutrition International
NNS	National Nutritional Survey
NRSP	National Rural Support Program
P&D	Planning and Development
PARC	Pakistan Agriculture Research Council
PBS	Pakistan Bureau of Statistics
PC-1	Planning Commission Form Number 1
PDHS	Pakistan Demographic and Health Survey
PDMA	Provincial Disaster Management Authority
PINS	Pakistan Integrated Nutrition Strategy
PRHPS	Pakistan Rural Household Panel Survey
PRSP	Poverty Reduction Strategy Paper
PSLM	Pakistan Social and Living Standard Measurement Survey
R&D	Research and Development
RUTF	Ready to Use Therapeutic Foods
RSP	Rural Support Program
SAM	Severe Acute Malnutrition
SBA	Skilled Birth Attendant
SFP	School Feeding Program
SCF	Small Commercial Farmers
SDGs	Sustainable Development Goals
SNF	Specialized Nutritious Foods
SUN	Scaling Up Nutrition
TDP	Temporarily Displaced Persons
UN	United Nations
UN OCHA	UN Office for the Coordination of Humanitarian Affairs
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USD	US Dollar
WASH	Water, Sanitation and Hygiene
WFP	World Food Programme
WHO	World Health organization

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The authors take full responsibility for the content of this report. While the report draws from the inputs, suggestions and comments by various parties, the authors of the report are solely responsible for the contents of the review and the views expressed in it, and no part of it can be attributed to any of the Advisory Group, SPA6 members or USAID.

AUTHORS AND COLLABORATORS

Principal Investigators

IFPRI
Dr. Stephen Davies, Senior Research Fellow IFPRI
Team Leader, Strategic Review

AKU
Dr. Sajid Soofi, Associate Professor

Other Authors

IFPRI Research Analysts:
Amna Ejaz
Asjad Tariq Sheikh
Wajiha Saeed
Muhammad Saad Moeen
Muhammad Saqib Shahzad Saleem

Saira Malik, Program Coordinator

Other Authors

Dr. Turab Ali, Senior Instructor
Shujaat Zaidi, Senior Scientist

Collaborators
Anam Bhatti
Saman Tahir

1 EXECUTIVE SUMMARY

1.1 Introduction

Access to safe and nutritious food is implicitly recognized as a basic right by the Islamic Republic of Pakistan under its Constitution, and by the current Federal Government administration, which is committed to ensure a food-secure and well-nourished population in its Vision 2025 document. This Strategic Review for Food Security and Nutrition in Pakistan aims to identify key challenges and prioritized areas for strategic action by the Government of Pakistan (GoP), supported by humanitarian, development, private sector and civil society partners. The Review was carried out by the International Food Policy Research Institute (IFPRI) and Aga Khan University (AKU) under the direction of the GoP's Economic Affairs Division (EAD) and guided by an Advisory Group co-chaired by the EAD Secretary and the Resident Coordinator of the United Nations in Pakistan. The remainder of this introduction delves into the important challenges and possibilities for food security and nutrition. The second part presents immediate and longer run actions that can be taken by government and all development partners to improve outcomes.

Nutrition and Food Security Status: Food and nutrition security are among the greatest challenges for Pakistan. More than half of its children under the age of 5 are either stunted, wasted or both; at least 18% of its women (of reproductive age) are underweight; and the overall prevalence of undernourishment (PoU) is estimated to be about 18% of the entire population as well, according to the National Nutrition Survey 2011 (NNS 2011). The high prevalence of undernutrition, particularly among women and children, has led to Pakistan having the 26th highest under-5 mortality rate in the world. Poverty in Pakistan is as high as 39%, based on the Multidimensional Poverty Index, which points to a large vulnerable and food insecure population. This situation is even is more critical considering the country faces great volatility from natural and man-made causes. Pakistan has a history of severe floods and the Long Term Climate Risk Index ranks Pakistan as the 7th most affected country over 1996-2015 (Kreft et al., 2014).

Targets for improvement: Given these circumstances, meeting the Sustainable Development Goals' (SDG) targets associated with food security and nutrition requires immediate action and rapid scale-up. To meet SDG targets by 2030, Pakistan needs to: eliminate the PoU of 18% entirely, reduce the stunting rate by 40% (which currently stands at 45%) to 27%, the under-5 mortality (currently at 89 per 1000 live births) by 75%, and the infant mortality rate (IMR) (currently 74 per 1000 live births) by 83%. Two SDG indicators associated with food insecurity (the Multi-dimensional Poverty Index and the Cost of Basic Needs-based poverty) need to be cut in half by 2030. One of the main causes of these alarmingly high rates of both undernourishment and food insecurity in Pakistan is that 68% of the population simply cannot afford a nutritious staple-adjusted diet (GoP and WFP, 2016a). A number of factors drive this outcome, including prices and market dynamics, and issues of equity, inclusiveness, and poverty. Other factors include poor sanitation, lack of availability of diverse diets, and cultural preferences and knowledge limits. Chapter 2 (Section 2.2) of this review provides a detailed review of Pakistan's status and progress on food security and nutrition.

The extent and location of poverty and nutrition insecurity: Given Pakistan's large population combined with high prevalence rates translates to a challenge of immense scale: there are over 70 million poor people, over 40 million people who are undernourished, and Pakistan has the third largest population of stunted children in the world. To achieve substantive progress towards food and nutrition security will require well-targeted planning. As shown in Table 1-1, within Pakistan, the highest prevalence rates occur in Sindh, Balochistan, Federally Administered Tribal Areas (FATA) and Khyber Pakhtunkhwa (KP). In each of these regions, the percentage of children who are undernourished exceeds 55%. However, in terms of numbers of people, Punjab and Sindh account for the bulk of Pakistan's undernourished women and children: of about 13 million undernourished Pakistani children, more than 9 million live in these two provinces; and of about 9 million underweight Pakistani women, about 7 million live in Punjab and Sindh. Section 2.2 of Chapter 2 also discusses Pakistan's poor and undernourished population in greater detail.

Table 1-1: The Spatial and Population Distribution of Poverty and Undernourishment in Pakistan

Province /region	Underweight women (aged 15 to 49)		Undernourished children*		Poor people**	
	Prevalence (%)	Estimated Population (Nos.)***	Prevalence (%)	Estimated Population (Nos.)***	Prevalence (%)	Estimated Population (Nos.)***
AJK	19.9	223,607	43.1	310,954	24.9	1,126,952
Balochistan	22.5	533,235	55.6	710,509	72.2	6,962,786
FATA	3.0	29,562	54.4	391,254	45.8	2,087,344
GB	17.4	53,204	50.1	83,110	48.3	606,420
KP	9.0	562,504	57.1	1,738,578	48.0	12,114,671
Punjab	17.7	4,751,447	46.6	6,258,574	30.9	32,346,496
Sindh	24.5	2,659,799	58.5	3,254,997	42.6	18,329,427
Overall	**18.1**	**8,813,357**	**51.1**	**12,747,976**	**38.2**	**73,574,097**

Sources: NNS 2011, GoP 2016a, World Bank's World Development Indicators

* Children who are either stunted, wasted or both

** Poor in terms of the Multidimensional Poverty Index (GoP, 2016a)

*** Estimated populations are based on population estimates using World Bank's World Development Indicators, and population distribution from NNS 2011.

The Rationale and Fiscal Space to Act: Undernutrition, particularly stunting and wasting among children, is closely associated with infant and child mortality. Severe stunting increases a child's likelihood of death by 4.1 times, and even moderate stunting by 1.6 times compared to children who are not stunted (Black et. al. 2008). In addition to the human toll, stunting exerts an enormous burden on the economy and government resources, thereby providing an added impetus to act: with the third highest population of stunted children under-five in the world, malnutrition in Pakistan is estimated to cost the economy nearly 3% of Gross Domestic Product (GDP) per year, which is higher than the cost of the energy crisis, and is equivalent to USD 7.6 billion annually (Bagriansky, 2017). The economic cost of undernutrition is analysed in Chapter 4 (Section 4.1) of this review.

Giving food security and nutrition a higher priority in government spending is feasible. Pakistan spends close to PKR 400 billion annually on direct and indirect subsidies to agriculture. In contrast, the cost of a recommended nutrition intervention package, scaled-up to 100% coverage by 2021 and carried through 2025 (PKR 190 billion), with added costs for needed institutional development, is thus equivalent to less than 10% of the annual costs of agricultural subsidies. Chapter 2 (Section 2.2.4) of this review provides detailed estimates of the costs and benefits of nutrition-specific interventions. Furthermore, state-owned enterprises receive funding similar to the value of agricultural subsidies, which may be an even less effective use of resources.

In agriculture, a number of existing government outlays can be rationalized and redirected to nutrition or to food security (through productivity enhancement, particularly to smaller farmers). The Government of Pakistan (GoP) incurs substantive losses by intervening in the wheat market using support prices, procurement, and border policies, and at times similar approaches have been applied to cotton and sugarcane. These government interventions tend to benefit large farmers, but not the small ones who constitute the majority of the farming population (PRHPS, 2015). In addition to support prices, large subsidies on irrigation and fertilizer also go to the larger farmers who use more inputs. These subsidies now are around PKR 56 billion, with another PKR 336 billion in indirect subsidies. Moreover, these policies lead to higher domestic prices that impose a disproportionate burden on the poor. Chapter 4 of this review discusses these gaps in fiscal space in detail, among other identified gaps.

Interventions for food security, specifically productivity-enhancing investments, reduce poverty, but also can lower commodity prices and thus have large impacts. They also yield nutrition benefits by simultaneously addressing the underlying determinants of nutrition allowing for a more nutritious and diverse diet to become more affordable. Nutrition-specific interventions also yield large benefits. Reducing stunting in a single population cohort translates to huge income, education and productivity enhancements over a lifetime. The returns on every dollar spent on nutrition-specific interventions are estimated to range from US$15 to $37 in South Asia (Shekar et al., 2017).

Steps to take: While the scale of the problems is large, we nonetheless find that significant progress can be initiated quickly. Our broad conclusions for nutrition are that nutrition-specific interventions can be scaled-up soon with existing delivery platforms, are highly cost-effective, and require re-allocations of government funds that are entirely within reason and feasible within a short span of time. Specifically, these interventions can be initiated quickly and alone can reduce stunting by 20% when scaled-up to 90% coverage rates (Shekar et al., 2017). These include encouraging breastfeeding and providing supplements and complementary feeding at the right times in a child's life, are the most immediate strategies to initiate sustained declines in stunting. However, since these approaches alone will reduce stunting by 20%, nutrition-sensitive interventions (interventions for dietary diversity, water, sanitation and hygiene (WASH)) are also needed, combined with interventions for food security which also serve to target the underlying causes of undernutrition (incomes, poverty, agricultural productivity). The specific interventions that are recommended by this review are summarized below.

1.2 Programs for Immediate Initiation

This review recommends a number of programs for immediate initiation. These are interventions that can be started quickly, with appropriate commitment and adequate funding, which can come through from manageable budget reallocations. They include a combination of nutrition-specific, nutrition-sensitive and food security proposals. These are summarized here as follows, while Chapter 5 (Section 5.2) of this review discusses these in further detail.

Promote exclusive breastfeeding. Breastfeeding for the first six months provides a child with adequate nutrition, especially when the mother is well-nourished, and gives protection from contaminated food, water and infectious diseases. Breastfeeding programs are by far the most cost-effective action in South Asia, according to the World Bank, as every dollar spent yields impacts worth USD 37. Infant and child nutrition counseling is the major intervention needed to improve exclusive breastfeeding rates, and can best be done by an expanded corps of Lady Health Workers (LHWs) and primary health center staff.

Provide Specialized Nutritious Foods (SNFs) to enhance the nutritional food available to children and mothers. Starting at six months, children progressively need more food of greater diversity, but they cannot eat a lot, and many mothers lack an understanding of required nutrients and the availability of a diverse diet. Careful design of programs for provision of complementary feeding is required. To take steps forward, children between 6 and 23 months must be identified, most likely by LHWs and Basic Health Units (BHUs), and nutritious foods must be provided frequently in adequate amounts. Possible delivery platforms can be The Rural Support Programs (RSPs), food departments or BHUs, depending on the situation and location.

Invest in micronutrient supplements. Because mothers and children often do not have sufficient food intake and variety, supplements are needed. Iron is an important supplement for pregnant women and school-aged girls, but is not currently provided outside of selected projects. The World Bank shows that, from a list of eight nutrition-specific interventions that reduce malnutrition, the most impactful per dollar spent is antenatal supplements to pregnant women, which yields USD 29.10 in benefits for each dollar spent. (This is reviewed in Chapter 2, Section 2.2.4). A range of supplements of iron, vitamin A, folic acid and zinc all have about USD 15 in benefits for each dollar spent, mostly in benefits for children. The delivery platforms discussed above are relevant, but also include schools to reach school age females.

Leverage media to promote breastfeeding and other best practices that suffer from a lack of awareness, such as avoidance of open defecation, benefits of supplements, and importance of nutritional awareness**.** Household dietary intake is dependent on numerous factors, with female education and nutritional awareness playing a vital role. The knowledge of the general population about concepts like minimal acceptable diet, appropriate feeding frequency and dietary diversity is extremely poor, even in the wealthiest quintiles. Media promotion alone will not change behavior, but it will raise awareness, which will enable behavior change activities to be more quickly effective.

<u>The next activities enhance food security, but also can support improved nutrition:</u>

Encourage fortification and other roles for provincial food authorities/departments. The provincial food departments have managed wheat distribution programs for many years and could be good institutions to help with complementary feeding and food programs for unreached and food-insecure populations. Food departments typically purchase wheat from farmers at a guaranteed price and release it to flour mills, which shows that they have experience in large and complex distribution programs. It could be a relatively small step to add micronutrients to fortify wheat, for example. Working with wholesalers, utility stores, and Benazir Income Support Program (BISP), these departments could manage procurement programs to increase dietary diversity by buying from contracted (and possibly small) farmers.

Expand social protection to reduce poverty and enhance nutrition. Nutrition goals can only be accomplished in the short-term by expanding social protection, most likely by increasing BISP payments. Currently, 5.7 out of 7.7 million eligible families are given PKR 18,800 per year, and evaluations show that poverty declined by about 3%. To extend this outreach by another 2 million families and raise the payment by 20% requires PKR 66 billion, a large but affordable cost given current expenditures in other less-productive areas. BISP is exploring ways to expand its graduation programs and nutrition education. Apart from BISP, Nutrition International (NI) is working with the RSPs to reach uncovered populations, so organizations like the RSPs are a third option for better reaching the poor.

1.3 Programs for Longer-term Benefits

Since nutrition-specific interventions can only reduce about 20% of stunting, other interventions, such as dietary diversity, WASH, nutrition education and increased income ultimately are needed to ensure that Pakistan is food- and nutrition-secure in the future. Many of these interventions have a long-term focus, and direct links to nutrition are less established. Nevertheless, developed and emerging countries that perform well on these measures also perform well with regard to stunting and other nutritional and food security measures. (Some countries are, however, guilty of "overshooting" the goal, with high rates of obesity and associated non-communicable diseases.) Although these recommendations are long-term, steps must start now and challenges must be met in order to have any possibility of food- and nutrition-security in Pakistan.

A summary of interventions is as follows while detailed discussion is contained in Chapter 5 (Section 5.3).

Increase crop and livestock yields significantly, at rates above recent experience, as population growth imposes an increasing burden on productive agricultural land. Recent production growth has been driven by traditional input expansion rather than technical change, but this approach needs to change in a substantial way. Increased agricultural R&D should therefore be a major priority, with a development of affordable and demand-driven products, with a productivity-driven focus that leads to lower prices and a more nutritious and diverse food supply. In a simple assessment in chapter 3 (section 3.3.1), we forecast the impact of differing yields on net trade of crop and milk production. Pakistan may have to import wheat to meet demand in the more pessimistic scenarios but could actually export up to 9% of production with yield growth of 2.5%. In the case of pulses, Pakistan will be the net importer in all

scenarios. On the other hand, increasing surpluses of rice and milk will allow for greater local consumption or more exports, which would lead to higher foreign exchange earnings. This assessment shows the importance of yield growth, and the possibility of agriculture adding to exports even with fixed acreage and a growing population.

Enhance resilience and disaster preparedness. Pakistan is affected by a high frequency of natural disasters as well as man-made events arising from military operations and political and economic instability. For communities to be resilient to adverse events, and for food security and nutrition to be sustainable *at all times*, these topics must be included in disaster preparedness. This requires that disaster preparation include early warning systems, emergency food reserves, and community-based programs that teach communities to prepare for unforeseen events. In the long-term, a shift is required from logistical planning to strengthening and coordinating the entire supply chain and network of the disaster management authorities.

Empower women in households and communities. Interventions are needed that bring positive change in the power structure of households, particularly in income-generating activities and food for the household. One way to do this is to enhance income-earning opportunities through rural business and enterprise development services for women, especially in sectors where women can participate and where large land holdings are not required, i.e. poultry and dairy, small ruminants, kitchen gardening, etc.

Strengthen the LHW system. LHWs have the most extensive interface with mothers and children. They need enhanced capacity to screen for stunting and other nutrition issues and to take advantage of significant potential for the delivery of nutrition services and awareness. Specifically, the LHW system needs significantly better support to expand coverage in remote areas of Sindh, KP, FATA, GB, and Balochistan to reach vulnerable groups and integrate services with BHUs. They also need to have appropriate and functioning weighing scales and length scales, as well as regular disbursement of salaries.

Enact legislation and provide funding for provincial agricultural research boards to link research institutions, extension workers, rural development associations and farmers, and to support public-private partnerships.

1.4 Supporting Policies

Policies set development directions and roadmaps for government priorities and investments; therefore, the status of their development has been a key area in this Strategic Review. Chapter 5 presents a group of supporting policies for the immediate and longer term activities shown above (in Sections 5.2.1 and 5.3.1). A major policy is the Multi-Sectoral Nutrition Strategy (**MSNS) and associated institutional structures.** As these arrangements are just beginning, observing and tracking progress should be a major part of all stakeholders' interests. The MSNS has the potential to review proposed projects from across a province or region for gender-sensitive and nutrition-sensitive components through the established Nutrition Cells in the provincial and regional Planning and Development (P&D) departments.

Other policies of importance to this set of activities include t**he Protection of Breastfeeding and Child Nutrition Act, Food Fortification Acts and the Early Marriage Restraint Act,** which has so far only been passed in Sindh and in amended version in Punjab.

For the areas likely to unfold in the longer term, most of the key policies reviewed and encouraged in this document include **agricultural policies and related policies.** So far, only KP has an agricultural policy in place, while others are at various stages of development at the national level and in Punjab, Sindh, FATA, GB and AJK. Similarly, there is a need to **finalize and implement the National Water Policy.** Issues related to water were the most often raised points in the consultative meetings during this review. As first steps, the National Water Policy should be finalized and passed, and a National Water Commission should be established with funding provided and technical experts supported. Finally, critical inputs to improved agricultural productivity are the recently passed **Seed Amendment and Plant Breeders Rights Act.** The ultimate goal of these policies is to create an industry that has a balance between the private and public sectors, in a symbiotic relationship. However, their implementation has been slow and these initiatives appear to lack sufficient incentives to encourage participation by the private sector.

Additionally, the Review points out several times that enacted policies also need operational rules and human resource technical capacity to design related programs and legislation, allocate funding, and ensure that relevant institutions have independence to act. Actions needed to improve the implementation of policies related to nutrition are listed below.

1.5 Supporting Institutional and Analytical Programs

In addition, the policies and programs discussed above also require further supporting institutional and analytical programs to ensure successful and sustainable implementation. Over-arching needs include: a **nutrition surveillance system,** a culture of **monitoring and evaluation (M&E),** and the **engagement of women champions** (See Section 5.1).

The programs recommended for immediate initiation require complementary measures such as **capacity strengthening** of front-line health workers in the area of nutrition, the development of a roadmap to encourage food **marketing, distribution and processing** industries, improving **storage**, and implementing **school-feeding programs (SFP)** as a nutrition-focused form of social protection (see Section 5.2). The longer-term activities recommended above would be supported by improved **rangeland management**, evaluations to identify effective **WASH** interventions and **behavior change communication (BCC)** strategies among others discussed in Section 5.3.

2 OVERVIEW AND CENTRAL PERSPECTIVES OF THE STRATEGIC REVIEW

This chapter presents an overview of the objectives and methodology of the Strategic Review, followed by an analysis of the location and nature of Pakistan's poor and food insecure, and progress so far with regard to food security and nutrition. The latter analysis includes a review of Pakistan's progress towards achievement of the UN's SDGs, the status of food security in Pakistan, and the financial costs and benefits of specific nutrition investments. These topics set the stage for the remaining analyses and recommendations in this report.

2.1 Strategic Review Objectives and Methodology

One of the most important basic rights of every person is access to safe and nutritious food to ensure survival and to thrive. The right to adequate food—as an essential right for any decent standard of living—was first formally recognized in 1948 by the United Nations in the Universal Declaration of Human Rights (UDHR). Article 25 states:

> *Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, and housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control.*

In Pakistan, the right to food for all its citizens is implicit in Article 38 of the Constitution, which mandates the "Promotion of social and economic well-being of the people" and requires that "The State shall – (a) secure the well-being of the people … by raising their standard of living …, (b) provide for all citizens, within the available resources of the country, facilities for work and adequate livelihood … [and] (d) provide all basic necessities of life, such as food … for all such citizens … as are permanently or temporarily unable to earn their livelihood on account of infirmity, sickness or unemployment." In 2004, Pakistan ratified the International Covenant on Economic, Social and Cultural Rights (ICESCR), which obligates Pakistan (in Article 11) to take appropriate measures to ensure "the right of everyone to an adequate standard of living for himself and his family, including adequate food …." Pakistan also ratified in 1990 the Convention on the Rights of the Child (CRC), which requires the country (in Article 24(2) (c)) to "combat … malnutrition … through the provision of adequate nutritious foods …."[1]

The Government of Pakistan (GoP) is therefore bound to ensure a food-secure and well-nourished population. The current administration has shown commitment towards this end as seen in their strategic planning document, *Vision 2025*, which was launched in 2013. Two of the seven pillars that frame the strategy -- Pillar I "Putting people first" and Pillar IV "Water, Energy and Food security" -- set objectives that lead specifically to ensuring food security and adequate nutrition for its population. Pakistan also joined the Scaling-up Nutrition (SUN) movement in 2013 and established a Nutrition

[1] See http://www.fao.org/right-to-food-around-the-globe/countries/pak/en/

Development Partners Group to help improve development partner coordination and multi-sectoral platforms at the provincial level.

2.1.1 Strategic Review Objectives

The Food Security and Nutrition Strategic Review is an independent, analytical, and consultative exercise that aims to identify key challenges faced by Pakistan in achieving food security and improved nutrition and to recommend prioritized areas of action for the GoP and its humanitarian and development partners.

The specific objectives of the Strategic Review are to:

- Advise the GoP on the acceleration of progress toward eliminating food insecurity and malnutrition in line with the relevant national and provincial policies/strategy documents (e.g. Pakistan Vision 2025, Provincial Growth Strategies, the MSNS and Nutrition PC-1s – Planning Commission's Form Number 1).
- Inform the planning phase of the One Programme III (OP-III) under the One UN/Delivering as One initiative, which will outline the common strategic and programmatic priorities of UN partners for Pakistan in the post-2017 scenario, including food security and nutrition.
- Enhance the engagement of UN agencies with national and provincial governments, and civil society and the private sector, on food security and nutrition, and ensure alignment of UN agencies' strategic orientation to national and provincial development goals, identifying opportunities for their contribution to the recommended actions based on their respective mandates and strategies.

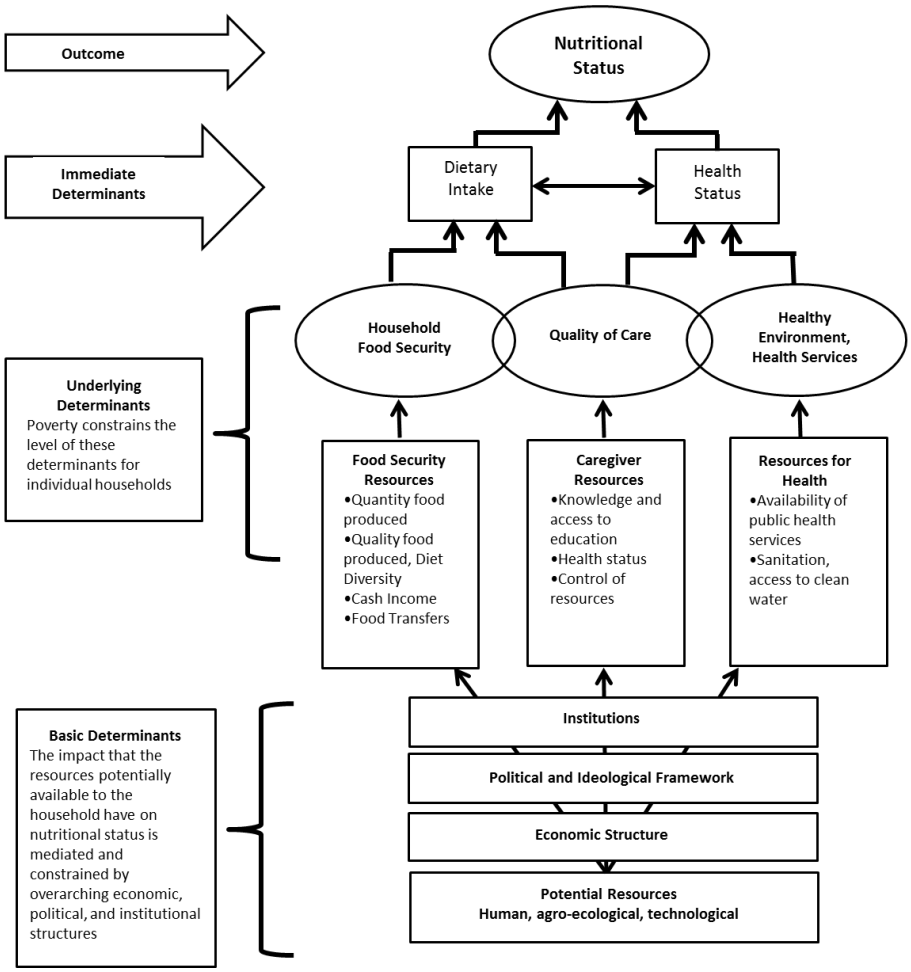
2.1.2 Strategic Review Methodology

This Strategic Review was carried out jointly by IFPRI and AKU, with IFPRI covering food security aspects and AKU focusing on nutrition. The review was undertaken under the direction of the GoP through the EAD. The process was guided by an Advisory Group co-chaired by the Secretary of the EAD and the Resident Coordinator of the United Nations Office, with nine appointed members representing government, civil society, the private sector, and academia. A secretariat, consisting of members of Strategic Priority Area 6 WFP, Food and Agriculture Organization (FAO), World Health Organization (WHO), United Nations International Children's Emergency Fund (UNICEF), and UN Women helped coordinate the effort as well.

The Strategic Review was conducted between June 2016 and May 2017 through a consultative and inclusive process, involving relevant stakeholders at the national and provincial levels. In addition, the technical review team carried out a desk review of relevant literature, developed analytical models, and drafted reports, which were shared with the advisory group and other stakeholders for validation with the agreed work plan. The first outputs were provincial consultation summaries and an *aide memoire*, which was produced after the first round of consultations. After the *aide memoire* was shared, further feedback was received from concerned stakeholders at the federal and provincial levels before the final report was drafted.

The methodology used to assess factors that contribute to malnutrition in Pakistan is Benson and Shekar's (2006) adaptation of UNICEF's Conceptual Framework for Malnutrition (1990), shown in Figure 2.1. According to the framework, the immediate causes of malnutrition are dietary intake and health risk, while the underlying determinants are in turn household food security, quality of care, health services, and the environment. The schematic also links *underlying* causes to several important *basic* determinants, related to potential resources available to the household, which are affected by the economic structure, political dimensions, and institutions.

Figure 2-1: The Conceptual Framework for Malnutrition



Source: UNICEF, 1990; Benson & Shekar, 2006

2.2 Pakistan's Progress on Food Security and Nutrition

Pakistan became a lower-middle-income country in 2008, according to the World Bank, and it achieved a 4.7% GDP growth rate in 2015-16, with a per capita GDP of USD 1,429.[2] However, despite this economic growth, the level of food security and nutrition in Pakistan has not risen.

Based on the Multidimensional Poverty Index (MPI), as of 2016, 39% of the population in Pakistan is poor, 20% is deprived in all aspects of health, education, and living standards (GoP, 2016a), and the food expenditure of almost 68% of households is below the staple-adjusted nutritious diet threshold (GoP and WFP, 2016a). The average daily caloric intake in Pakistan exceeds the recommended daily value of 2,350 kcal per adult equivalent person per day, but among the urban poor the average barely reaches the 1,786 kcal undernourishment level, and the poor in rural areas only fare slightly better, at 1,848 kcal. Since about 55% of rural inhabitants are poor, the latter calorie deficiency is a serious burden, and since Pakistan is highly disaster-prone—affected by severe floods, droughts, and earthquakes—many more people are vulnerable to falling into poverty and food insecurity.

According to the 2015 *Global Nutrition Report* (IFPRI, 2016), Pakistan is among just 20 countries that have met only one of the five World Health Assembly targets on nutrition, which implies that only a minority of children are growing up healthily in Pakistan. About 45% of children in Pakistan are stunted,[3] making Pakistan home to the third largest population of stunted children in the world (PDHS, 2013; Water Aid, 2016). Furthermore, 11% of children (under the age of 5) are wasted, and 30% are underweight (PDHS, 2013), while micronutrient deficiencies are alarmingly widespread. Among pregnant women, 51% are anemic, 46% suffer from vitamin A deficiency, 48% from zinc deficiency, and 69% from vitamin D deficiency (NNS, 2011).

This widespread malnourishment among children in turn leads to a loss of life. Severe stunting increases a child's likelihood of death by 4.1 times, and even moderate stunting by 1.6 times, compared to children who are not stunted (Black et. al. 2008). The under- 5 mortality rate for Pakistan is currently 89 per 1,000 live births, ranking it 26th highest in the world, while the IMR is also high at 74. In addition to mortality, malnourishment is associated with a higher incidence of illness and impaired cognitive development leading to, loss of productivity, and negative impacts on education.

As a result, malnutrition in Pakistan is estimated to cost the economy 2% to 3% of GDP per year, which is higher than the costs of the energy crisis (GoP and WFP, 2016a). A 2017 report by WFP and the Pakistan Ministry of Planning, Development and Reforms (MoPDR) calculated the cost of malnutrition at PKR 760 billion annually (SUN and WFP, 2017). On the other hand, studies also calculate the costs and benefits of nutrition interventions in Pakistan, and one such analysis is provided later in subsection 2.2.3.

[2] https://www.imf.org/en/News/Articles/2016/08/04/14/01/PR16373-Pakistan-IMF-Staff-Completes-Twelfth-and-Final-Review-Mission

[3] Stunting is defined as low height for age, wasting as low weight for age, and underweight as low weight for height (WHO, 2010; Wang and Chen, 2012).

However, there have been significant achievements as well. According to the State of Food Insecurity 2015, the percentage of population that is undernourished has declined by 12.4% since the 1990s (FAO, 2015b). Pakistan was also able to achieve its Millennium Development Goal (MDG) target for sanitation by halving the proportion of households without sustainable access to basic sanitation. Likewise, concerning the MDG indicator relating to access to improved water resources (tap water, hand pumps and electric motor propelled water), a very high proportion (89%) of households in Pakistan now have access to an improved water source (PSLM, 2014-15). Furthermore, road infrastructure has improved significantly, and over 65% of the population is estimated to be within three hours of a city with a population of 500,000, which improves linkages between rural and urban areas to help improve economic as well as social development variables (Kedir, Schmidt, and Waqas, 2016).

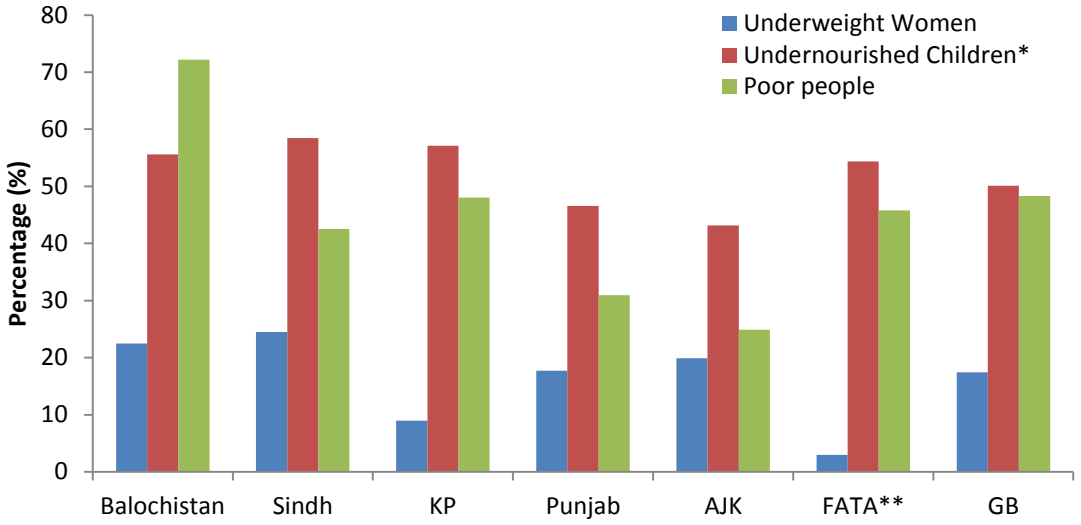
There is also at present a renewed commitment within the country's government and administration to achieve significant reform in the areas of food security and nutrition. The adoption of the MSNS in each of the provinces and regions is a significant policy advancement, and associated investments and funds are beginning to come through. These initiatives and the current momentum, if given the needed support, can help Pakistan reach a critical turning point in its quality of life and human development, and have the potential to contribute to many aspects of Pakistan's economy and progress.

The following subsections show four summary perspectives that are important for this Strategic Review and the context in which the Review was undertaken, namely the locations and nature of Pakistan's poor, and food and nutrition insecure, the UN's SDGs, the overall state of food security during the past decade and a half, and the costs and benefits of some impactful nutrition specific investments. These four topics set the stage for the remaining analyses and recommendations in this report.

2.2.1 Who and where are Pakistan's Poor

Undernutrition rates, while generally high in each province and region, are particularly high in Balochistan and Sindh. As shown in Figure 2.2, a quarter of women in Sindh are underweight, and 58% of its children either stunted, wasted or both. Similarly in Balochistan, 22% of women and 56% of children show signs of undernourishment. In Balochistan, the issue is compounded further with a significantly higher rate of multidimensional poverty at 72%. FATA is also likely to be a particularly disadvantaged region with 54% of children being stunted, wasted or both and 46% poor (data on women were unreliable for FATA). KP too has a high rate of stunting/wasting at 57%, but the incidence of underweight women is the lowest in the country, at 9%. The remaining regions in the country (Punjab, AJK, and GB) fare slightly better, with undernourishment rates among children under 50% and underweight rates among women below 20%.

Figure 2-2: Rates of Underweight Women, Undernourished Children and Poverty by Province/Region



Sources: NNS 2011, Multidimensional Poverty Index (GoP 2016a)

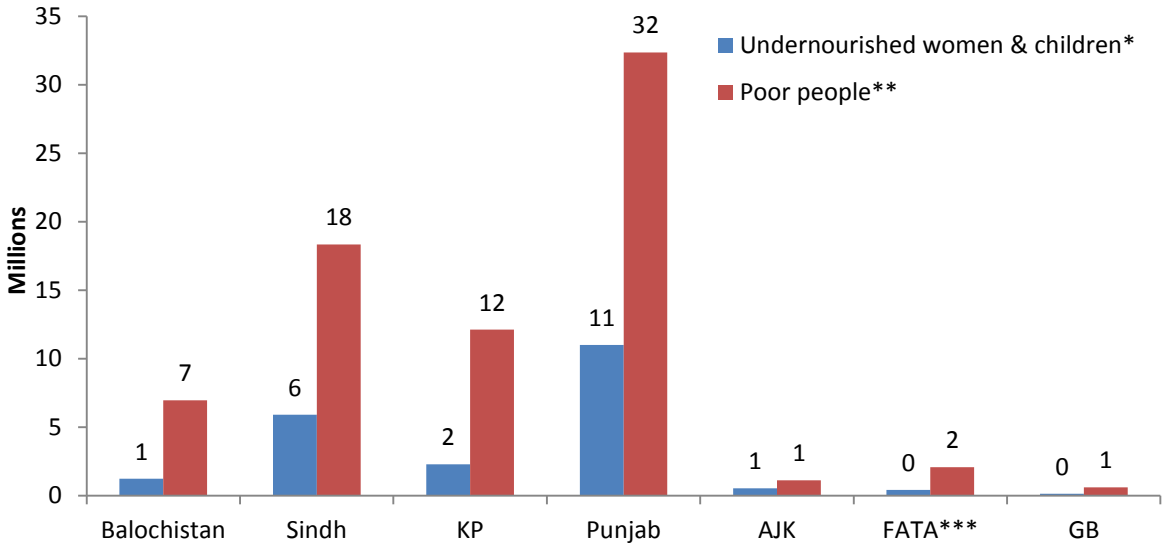
* These included children who are moderately or severely wasted, stunted, or both.

** The NNS in FATA was affected by high refusal rates and hence is not reliable.

Comparing districts across the country, three FATA agencies (D. I. Khan, Tank, and Lakki Marwat), and one KP district (Battagram) stand out with the highest rates of undernourished children, ranging from 80 to 85%. These four districts are followed by district Haveli in AJK, with 75% of children undernourished. This is unusual as AJK overall has the lowest undernutrition rates in the country. In Sindh, Shahdad Kot, Jacobabad and Sukkur lag the most, with over 70% of children undernourished. In KP, after Battagram, the highest undernutrition rates are in D.I. Khan (71% undernourished children) and followed by Nowshera (64%). In Balochistan, the districts of Khuzdar, Killa Saifullah and Bolan/Kacchi are the 3 worst in terms of undernutrition rates among children (65 to 69%). In GB, district Diamer stands out with 63% of children being undernourished. In Punjab, the districts of Pakpattan, D.G. Khan, and Rajanpur have the highest undernutrition rates among children (around 60% in each).

However, once we account for the 2016 populations in the provinces and regions, the largest populations of undernourished women and children, and poor people are in Punjab and Sindh (in Figure 2.3). We estimate that Punjab and Sindh are home to 11 million and 6 million undernourished women and children, respectively. The rest of the country all together has about 5 million undernourished women and children (Balochistan has 1.2 million and KP has 2.3 million. AJK has about half a million, while GB is home to about 140,000. The data on women's nutritional status in FATA are unreliable due high refusal rates). The distribution of poor people is similar: Punjab and Sindh are home to about 51 million poor people (in terms of MPI) while the rest of the country together has about 23 million poor people.

Figure 2-3: Nos. of Underweight Women, undernourished Children and Poverty by Province/Region



Sources: NNS 2011, Multidimensional Poverty Index (GoP, 2016a), and World Bank World Development Indicators for population.

* Underweight women and children who are either stunted, wasted or both (prevalence rates from NNS, 2011

** Poor in terms of the Multidimensional Poverty Index (Incidence rates from GoP, 2016a)

*** NNS data for FATA is unreliable due to high refusal rates

2.2.2 Pakistan's Performance on MDGs and Engagement in the SDGs

Pakistan had a fairly dismal performance on the Millennium Development goals (MDGs), that expired in 2015 (See Box 2.1), attributed to a lack of ownership by successive governments, along with poor stakeholder buy-in. Since then, the federal and provincial governments have shown a renewed commitment to achieve the SDGs. As one of the early adopters of SDGs, in February 2016 the National Assembly of Pakistan passed a unanimous resolution in support of the SDG 2030 Agenda; a total of PKR 35 billion has been allocated so far for its implementation. Subsequently, a federal level SDG Unit has been set up in the MoPDR along with provincial units in the P&D Departments in Punjab and Sindh, with the process underway in Balochistan, KP, and the three regions of AJK, GB, and FATA.

The SDG framework suggests that countries, in addition to adopting and measuring global indicators, will need to develop complementary national indicators. Since SDGs advocate wide participation of all stakeholders, the structure at the national level requires substantial work where data gaps are large and monitoring capacities are low. In this regard, SDG Units at the MoPDR and United Nations Development Program (UNDP) Pakistan have held numerous meetings with federal and provincial bureaus of statistics, relevant stakeholders and development partners to consolidate a list of indicators and a methodology for their collection. It has been decided that data would be collected at the district level, with a periodicity of three years. Greater coordination across surveys will be ensured to eliminate duplication of efforts in data collection, thus saving time and resources. The timing of surveys such as

the MICS will be coordinated across provinces, so that the data collected is relevant and spatially comparable for the given time period across Pakistan.

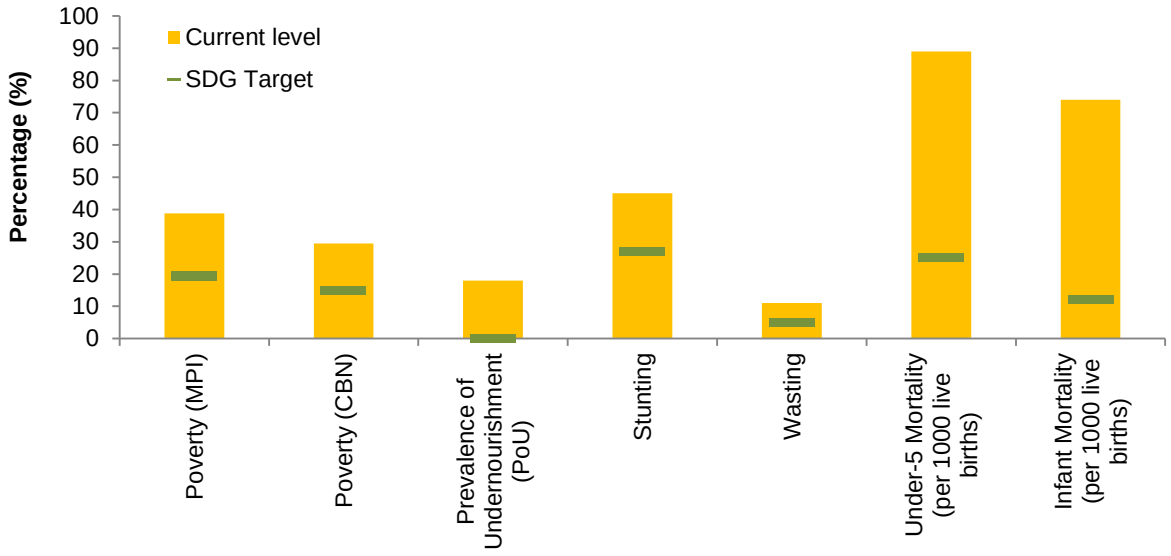
An estimated 110 to 120 indicators are being aligned for the SDG monitoring process in Pakistan. Much effort is currently being invested into the identification and evaluation of data sources and standards of reporting for each indicator. If missing, these standards would then be drawn up for such indicators through a consultative process with relevant stakeholders. This effort also includes the construction of composite indices, which would aid in understanding the larger picture of development through the amalgamation of individual components. An effort to construct such an index for food security was carried out in 2008 in the Taskforce Report on Food Security, and is updated as part of this Strategic Review in the following section. The areas related to food security and nutrition will have broad contributions to the entire SDG process. The Global Nutrition Report (2016) estimates that 12 of the 17 SDGs have indicators that are directly linked to nutrition. With nutrition-relevant indicators in a majority of the SDGs, success in food security and nutrition goals will go a long way towards meeting many of the 17 indicators. However the enormity of this task is clearly visible in Figure 2.4, which lays out the current status of food security and nutrition in the country, as depicted through a set of indicators, and their respective SDG targets (horizontal bars). The current level of under-5 mortality that stands at 89 (per 1000 live births) is more than 3 times the SDG target of 25, while the current IMR (of 74 per 1000) needs to be reduced by 83% to reach the target of 12. The two indicators for poverty show that rates need to be cut in half, while undernourishment needs to be completely abolished. The stunting rate needs to decline by 40% from 45% to 27%, and wasting levels from 11% to 5%.

Box 2-1: Provincial Performance on the Millennium Development Goals

Although **Punjab** performed comparatively better than other provinces, it still lagged behind on key indicators, such as prevalence of underweight children below 5, proportion of population below minimum level of dietary consumption, mortality rates, immunization against measles and lady health workers' coverage. For **Sindh**, while substantial progress was made under MDG 3 (Promote Gender Equality and Empower Women) and MDG 7 (Ensure Environmental Sustainability), targets were not only missed but also fell short of the national average in all indicators of MDG 1 (Eradicate Extreme Hunger and Poverty), especially the prevalence of underweight children. Performance also lagged for MDG 5 (Improve Maternal Health), where the maternal mortality ratio, births attended by skilled birth attendants, contraceptive prevalence rate, total fertility rate and antenatal coverage reported for Sindh fell considerably short of the rates required for attaining the set targets.

Khyber Pakhtunkhwa achieved its target for indicators related to forest cover and land area protected for conservation of wildlife under MDG 7, but failed to perform on other indicators. Progress was very poor for MDG 3, with performance on all indicators below national averages. In MDG 4 (Reduce Child Mortality), performance lagged in the indicators of infant mortality, immunization of children, immunization of children against measles and lady health workers' coverage. Finally **Balochistan**, being the poorest performing province, did not achieve any MDG in its entirety. Although below the national average for almost all indicators, performance was especially worrisome in health. Balochistan underperformed in all indicators of MDG 5, with a staggeringly high infant mortality rate by national standards.

Figure 2-4: Selected SDG Targets on Poverty, Food Security, and Nutritional Outcomes for Pakistan



Source: Economic Survey of Pakistan 2015-16; GoP 2017; PDHS 2013.
Note: Horizontal bars represent the target set forth by the SDGs for each of the indicators.

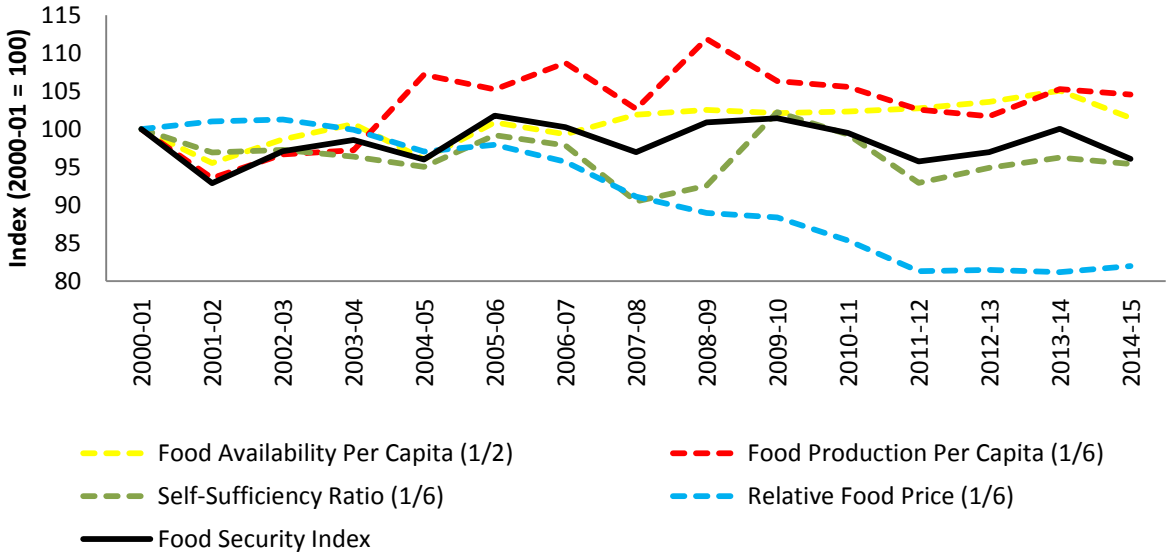
2.2.3 Pakistan's Food Security Index

Initially put forward in the Taskforce on Food Security Report of 2008, the Food Security Index is based on four indicators that describe how food security in the country failed to improve after 2000-01 (Figure 2.5). The overall index, represented by the black line, has fluctuated downward from 100 in 2000-01 to 95 in 2014-15. The index indicates a high susceptibility to negative shocks, such as those caused by the drought of the early 2000s, the global food crisis of 2007-08, and the floods of 2010.

Studying the trends in the various component indicators, the per capita food availability, measured in terms of average daily per capita caloric supply, has witnessed sluggish growth since 2007, peaking during 2013-14, but ending in 2014-15 just 1% above the 2000-01 value. The average per capita caloric supply during this period was 2,430 kcal, which is above the minimum level of 2,350 kcal set by the MoPDR. During 2014-15, however, per capita food availability again fell 3%, thus also causing a decline in food security index.

Domestic food production in the country has witnessed large fluctuations, as seen in the per capita food production index, revealing the sector's susceptibility to weather and price shocks. While per capita food production has improved since the early 2000s, and peaked in 2008-09, performance has mostly declined since then, and is just 5% above the value at the beginning of the series. In the face of such fluctuations, availability needs to be met through trade. The index for self-sufficiency, which shows the value of production divided by value of net availability (production less exports plus imports) reveals a high dependency on food imports. Being largely driven by edible oil imports, this ratio is impacted not only by import volumes, but also movements in international terms of trade, as was the case during the global food crisis. The improvements in the self-sufficiency index after 2007-08 were once again wiped out after the floods of 2010-11, and have yet to recover.

Figure 2-5: Trends in Food Security in Pakistan



Note: Numbers in parentheses are the weight given to each indicator in construction of the Food Security Index.

Food accessibility is woven into the food security index through movements in the level of food prices relative to the overall consumer price index (ratio of consumer price index to food price index). Interestingly, although indices for domestic food production, self-sufficiency ratio, and food availability performed poorly during the early 2000s, relative food prices remained stable. Since 2003-04 however, food prices have been rising much faster than the overall price levels (and therefore the relative food price has trended downward). As noted in the Taskforce report, this food price rise could partially be attributed to the attempt to improve the terms of trade in agriculture with respect to rest of the economy by raising procurement/support prices (especially of wheat).

Following the Taskforce Report, the final index is constructed through a weighted sum of the four indicators, with food availability per capita given the highest weight, at three times the weight assigned to each other indicator. Figure 2.5 shows that while per capita availability is being met and food production has also increased since 2000, albeit with large fluctuations, the main forces driving the Food Security Index have been the growing dependence on food imports (mostly edible oil and pulses) and increasing food prices. Given the importance that the pillar of 'economic accessibility' has in the overall food security situation of Pakistan, the trend in the Food Security Index would have deteriorated further if the indicator of relative food prices were given a higher weight.

2.2.4 Financing Needs and Sources for Nutrition Targets

In this section, we estimate the funding required to achieve significant progress on key nutrition targets by 2025. These estimates are calculated for interventions that address four of the World Health Assembly's global targets, related to stunting, anemia, exclusive breastfeeding, and wasting that are assumed to be funded to 2025. This follows the World Bank's Framework for Investment in Nutrition

(Shekar et al., 2017), which recommends a package of preventive nutrition-specific interventions needed to achieve the four targets.[4] Their analysis scales-up interventions such that coverage rates rise from baseline levels to 100% by 2021, and 100% coverage rates are maintained through to 2025. See Table 2.1.

Cost Options for Nutrition Investments. We replicate their analysis to estimate the financing needs for Pakistan, and find that the full package of interventions requires a total cost of about PKR 193 billion from 2017 to 2025. Table 2.2 shows the breakdown of this cost by intervention and phase, and shows that the treatment of severe wasting is by far the most expensive, accounting for PKR 68.6 billion (over a third) of the total cost. However, in the estimation of this cost, the rate of severe wasting was taken to be 4.9% for the entire period. In actuality, its rate may be expected to decline following past trends and with the implementation of other interventions, leading to lower costs. Similarly, in the case of balanced energy-protein supplements and public provision of complementary foods for pregnant women and children living in poverty, the rate of poverty (based on the USD 1.90 per day poverty line) was assumed to be 6.1%[5] in all years. This rate may decline as well, and thus actual costs may be lower.

[4] The exception is wasting where their package, including the cost of treating severe wasting, is estimated due to a lack of consensus on interventions to prevent wasting.

[5] This is the latest available estimate from the World Bank World Development Indicators (WDI) database for the USD 1.9-per-day poverty line.

Table 2-1: Full Set of Intervention in Pakistan for 4 Nutrition Target Areas

Target area	Intervention	Target population	Unit cost of intervention in South Asia (2015 PKR)*	% of Target pop. covered in baseline
Stunting	Antenatal micronutrient supplementation**	Pregnant women	309	22.1
	Infant and young child nutrition & hygiene counseling**	Mothers of children 0–23 months old	513	36.4
	Balanced energy-protein supplementation for pregnant women	Undernourished pregnant women living under the poverty line (USD 1.90/ day)	1693	0
	Vitamin A supplementation for children	Children 6–59 months old	9	72.1
	Prophylactic zinc supplementation for children	Children 6–59 months old	240	0
	Public provision of complementary foods for children	Children 6–23 months old living under the poverty line (USD 1.90/ day)	2,903	36.3
Anemia	Iron and folic acid supplementation for non-pregnant women	Girls 15-19 years old attending school (targeted via in-school delivery program)	46	0
		Non-pregnant, non-school going women 15-49***	33	0
	Antenatal micronutrient supplementation**	Pregnant women	309	22.1
	Wheat flour fortification	50% of general population	20	0
Exclusive Breastfeeding	Infant and young child nutrition & hygiene counseling**	Mothers of children 0–11 months old	513	36.4
	Pro-breastfeeding social policies	General population	100 million p.a.	37.7
	National breastfeeding promotion campaign	General population	400 million p.a.	1.1
Wasting	Outpatient treatment of severe acute malnutrition	Children 6-59 months old suffering from severe wasting	15,815	52.23

Source: Compiled from Shekar et al. (2017), excluding malaria-related interventions not applicable to Pakistan.

*Estimates from Bangladesh, India, Nepal and Pakistan.

**These interventions overlap across targets. For these interventions, if the cost varies across different targets, the highest cost is applied in the total costing exercise.

***The unit cost of delivering iron and folic acid supplements to this group is taken to be the average of the following unit costs (in USD): USD 0.22 when delivered through community health system delivery, USD 0.24 when delivered through private retailers with markup, and USD 0.54 when delivered through hospital/clinic system.

Shekar et al. (2017) also offer a second alternative, the "Catalyzing Change" package, which includes a scale-up of all interventions in the priority package, plus a phased approach to scaling up public provision of complementary foods, balanced energy protein supplementation, prophylactic zinc supplementation, and weekly iron-folic acid supplementation for women outside of schools. It is assumed that, for the latter set of interventions, during the first five years, emphasis will be placed on establishing global guidelines and on operational research to develop effective delivery platforms, or to develop less expensive products and more cost-effective technologies (such as rice fortification). In general, costs are approximated as the cost of scaling up this set of interventions from 0% to only 10% coverage in the first five years. In the subsequent five years, it is assumed that the expansion of coverage of those interventions will accelerate and reach 60% by 2025. This package would cost a total of PKR 145 billion over nine years.

Economic Benefits of Nutrition Investments. In Table 2.2, the economic benefits of investing in nutrition interventions are also estimated, by intervention. These are based on benefit-cost ratios provided by Shekar et al. (2017), which in turn are based on the impacts that these interventions are estimated to achieve, including lives saved, stunting prevented and productivity improvements. They find that interventions for breastfeeding are by far the most cost effective; in South Asia, every dollar spent on breastfeeding interventions yields impacts worth USD 37. Infant and child nutrition counseling is the major intervention for improving exclusive breastfeeding outcomes. This counseling is also an intervention for stunting, and is therefore targeted to all mothers of children less than two years old, not just mothers of 0-6 month olds. After adjusting for this increase in target population, every dollar spent on infant and child nutrition counseling yields benefits worth around USD 24. Antenatal supplements for pregnant women yield impacts on both stunting and anemia, and therefore yield the highest payoff, with every dollar spent on antenatal supplements yielding around USD 29.10 in benefits.

Looking at the total benefits, the highest appears to be for zinc supplementation for children (or fortification), followed by nutrition counseling for infants and mothers. These interventions are followed by a series of micronutrient supplements, fortification and breastfeeding campaigns that yield between USD 1.0 and 3.0 billion in benefits. At the lower end are supplements to school-age girls, outpatient Severe Acute Malnutrition (SAM) interventions and energy protein supplementation.

Sources of Funding for Nutrition Investments. Throughout this report, analysis will be offered that argues that close to PKR 400 billion goes annually into direct and indirect subsidies to agriculture in Pakistan, including for fertilizer, water, wheat procurement and other purposes. Thus, the cost for one year of the full nutrition intervention package, scaled-up to 100% coverage by 2021 and carried through 2025 (PKR 190 billion), with added costs for needed institutional development, is equivalent to less than 10% of the annual costs of agricultural subsidies. State-owned enterprises also receive funding similar to the value of agricultural subsidies. Therefore, there is ***no financial reason*** not to embark on focused and supported efforts to enhance nutrition in the areas described in this section.

Remaining Chapters in the Report. Chapter 3 presents a situation analysis of the relevant determinants of children's nutritional status and the state of food security as they relate to Pakistan. Chapter 4 points out the gaps in policies and programs, and presents a set of recommendations for both food security

and nutrition. The final chapter, Chapter 5, highlights the priority recommendations and synthesizes the results by summarizing recommendations from Chapter 4 in immediate actions that can be taken as well as longer term activities in analyses, policies, and programs that will help move forward towards improved food security and nutrition. Provincial and regional input was crucial in developing this report, and hence the appendices provide individual reports highlighting the specific status, gaps, and recommendations for each province and region.

Table 2-2: Cost of Nutrition Intervention Packages, in Billion PKR*

Intervention	Total Cost, Billion PKR, 2017-2025			Benefit per Rupee Spent, PKR	Total Benefit, Full Package, Billion PKR
	Full Package	Priority Packages	"Catalyzing Change" Package		
Antenatal micronutrient supplements for pregnant women	10.2	10.2	10.2	29.10	297.9
Balanced energy-protein supplementation for pregnant women living under USD 1.9 a day	4.4		1.2	15.10	66.3
Infant and young child nutrition counseling (for mothers of children less than 2 years)	23.5	23.5	23.5	24.35	571.4
Vitamin A supplementation for children (6-59 months)	0.5	0.5	0.5	15.10	6.9
Prophylactic zinc supplementation for children (6-59 months)	43.5		12.1	15.10	656.8
Public provision of complementary foods for children living under USD 1.9 a day	7.0		7.5	15.10	105.3
Iron and folic acid supplementation for non-pregnant women (15-49 years excluding school-going 15-19 year olds)	11.7		3.3	14.00	163.2
Iron and folic acid supplementation for school-going girls (15-19 years)	1.5	1.5	1.5	14.00	21.3
Wheat flour fortification (for 50% of general population by 2021)	16.9	16.9	16.9	14.00	236.4
National breastfeeding campaign and pro-breastfeeding social policies	5.0			37.00	186.5
Outpatient treatment of SAM (for all cases among 0-59 month olds)	68.6	68.6	68.6	2.10	144.1
TOTAL	192.7	121.2	145.4		

Source: Authors' estimates based on population projections from World Bank WDI database, and National Nutritional Survey (NNS) 2011 for incidence of severe wasting.

*These costs take into account program costs: an additional 9% of the estimate is added for capacity development, 2% for M&E, and 1% for policy development in addition to the total direct financing needs.

3 SITUATION ANALYSIS OF FOOD SECURITY AND NUTRITION IN PAKISTAN

Through its ownership of the SDGs, the GoP has bound itself to eliminate hunger, and provide food security, healthy lives and decreasing infant, child and mother mortality. The UNICEF causal framework of malnutrition describes these determinants in depth, so in this chapter we explore some of their dimensions for Pakistan. We start with the nutritional status of children, and then evaluate the situation of some of the *immediate* determinants of nutritional status, namely dietary intake and maternal health status. Analysis of these immediate determinants is followed by an assessment of *underlying* determinants, which include food availability, accessibility and sustainability. Then selected comments are given on *basic* determinants.

3.1 The Nutritional Status of Children

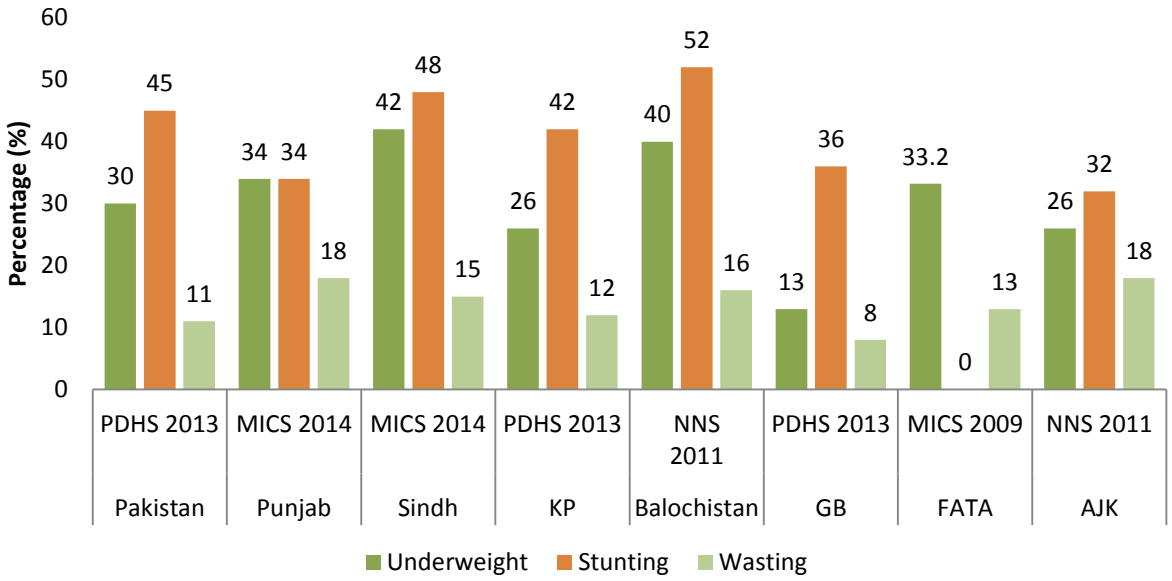
This situation analysis of nutrition and food security begins with a presentation of the nutrition status of children under five in Pakistan, where the elements are generally presented as levels of stunting, wasting and underweight (See footnote 3 in Chapter 2). Stunting is often most focused upon, as it gives evidence of long-term chronic malnutrition. Moreover, stunting has been shown to cause serious and permanent cognitive losses that lead to lifelong issues, which are not thought to be reversible after a child is three years old (Bhutta et al., 2013). Moderately stunted children are 1.6 times more prone to die than those who are not stunted (Black et. al., 2008). This likelihood increases with severe stunting and wasting, with the highest risk found in children with all three indicators of malnutrition.

Pakistan has the 8th highest stunting rate in the world, resulting in the 3rd highest number of stunted children, with progress towards its reduction off course (IFPRI, 2016; WaterAid, 2016). Moreover, Pakistan ranks 107 out of 118 on the Global Hunger Index of 2016, tied with Ethiopia, and much below Bangladesh, India, and Sri Lanka. The country only outperforms Afghanistan, Yemen, and a few African countries. As outlined in Chapter 2, the current nutritional status of children is critical and costs Pakistan much economic benefit and unrealized potential in the country's youth. Apart from a high risk of mortality, undernourished children have compromised immune systems, are prone to infectious diseases, and have lower IQs, poor educational performance, and impaired physical development. Furthermore, malnutrition in children under five raises the likelihood of developing non-communicable diseases (Victora and Rivera, 2014). This is evident from the fact that 55% of overweight children in Pakistan are also stunted (Satti and Khalid, 2015). The cognitive problems lead to economic losses of about 3% of GDP in Pakistan according to one study (Bagriansky, 2017), and the broader impacts of poor nutrition on health, through diabetes and other health problems, is estimated to be between 4% and 8% of GDP in major low and middle income countries (Shekar et. al, 2017).

The levels of the three main measures of undernutrition are seen in Figure 3.1, which shows the nutritional status of children at the national and provincial/regional levels. Sindh suffers from the highest underweight condition at 42%, with Balochistan almost at the same level, while the other provinces are near or lower than the national average. The level of stunting is about 9% lower in Punjab

than the overall Pakistan value of 45%. However, Sindh, Balochistan and GB experienced a high prevalence of stunting, as almost half of the children are stunted. Although the rate is 3% lower in KP than for overall Pakistan, it is still alarming at 42% (PDHS, 2013). All stunting values are in WHO's *Very High Prevalence* category, with the exception of Punjab, which is at *High Prevalence*, and as such, Pakistan ranks 125 out of 132 evaluated countries in the 2016 Global Nutrition Report, very nearly at the bottom. Wasting at the national level is about 11%. The level of wasting is higher by 2-3% in Sindh, KP, Balochistan and AJK, while GB has lowest wasting rate in the country, at 7%. A value of 15% or more is seen as *Critical*, the highest level, in WHO's scale (WHO, 2010).

Figure 3-1: Undernourishment of Children in Pakistan



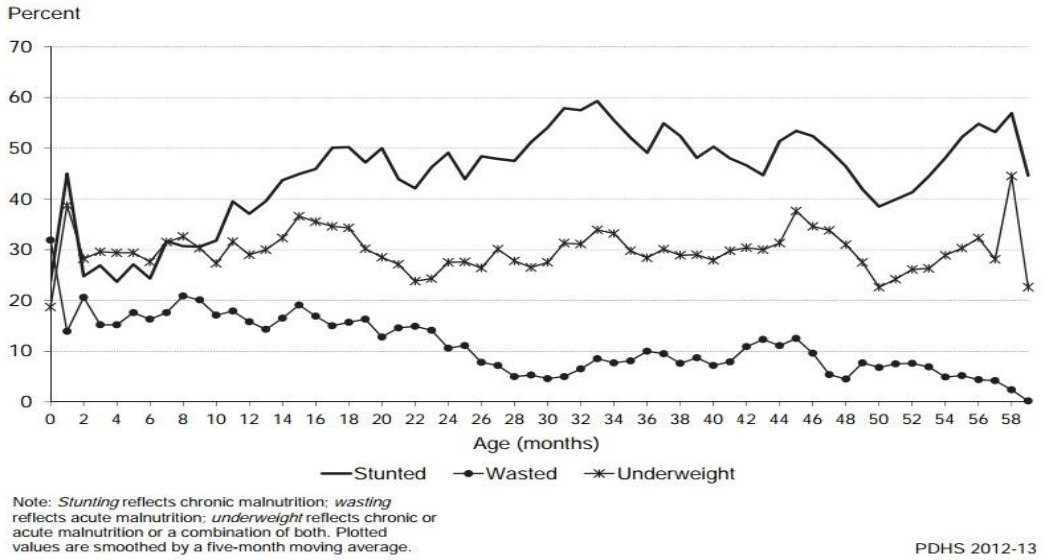
Source: PDHS, 2013

We also compared the country measures in 2011 versus 2001, when an earlier NNS was administered. Several dramatic trends are evident since the earlier study, as the proportion of underweight children declined by over 10%, thereby showing significant progress in this measure, but stunting worsened by 13%. Wasting did not show much change.

Looking at the time path of stunting, wasting and underweight proportions in children, as in Figure 3.2, shows the challenges that arise when attempting to improve children's nutrition. The national situation derived from the Pakistan Demographic and Health Survey (PDHS) 2013 has 26% of children stunted *at birth*, more than 30% are wasted, and about 20% are underweight. After that, children's malnourishment rises from 6 until 23 months, so that 50% of children are stunted at two years of age, and the underweight prevalence worsens to about 30%. Wasting, however, declines to 10%. After the peak, seen a little before three years of age, stunting declines but stays between 40% and 50% until five years of age. The rise in stunting and underweight proportions is a product of low breast-feeding rates, unbalanced nutrition and exposure to pathogens. Only 16% of mothers initiate breastfeeding within the first hour of birth, and only 39% of children are exclusively breastfed, a level much lower than optimal.

In addition, only 31% of children aged 6-8 months are introduced to complementary foods in a timely manner (PDHS, 2013). These factors are explored in more depth in subsection 3.2.1 on Dietary Intake.

Figure 3-2: Nutritional Status of Children by Age, PDHS 2013



The time path of the nutritional situation of children also varies by province. In Punjab, 17.5% of children are stunted, 31% are wasted and 31% are underweight by the age of 6 months (MICS-Punjab, 2014). The Sindh status has around 27% of children stunted, 22.2% wasted and 36.2% underweight (MICS-Sindh, 2014). In both provinces, the stunting rate doubles after six months from 17.5% to about 35% in Punjab and 27% to more than 45% in Sindh. After two years, the increase in stunting still occurs, but at a much lower rate. (The provincial Figures are shown in the Appendices).

Table 3.1 shows two added dimensions of the nutritional status of children, namely the mortality rates and micronutrient deficiencies. The under-five mortality for Pakistan rate rests at 89 per 1000 live births, ranking 26th highest in the world, while the IMR is also high at 74 (PDHS, 2013). There is considerable variation across provinces and regions, as GB (89, 71) and Punjab (93, 75) are close to the national level indicators, whereas FATA (104, 86) and Sindh (104, 82) are above, with some of their mortality rates over 15% higher than the national average. Interestingly, KP (70, 58) and Balochistan (59, 49) are significantly lower than average. However, in terms of total undernourishment, Punjab and Sindh have 17 million mothers and children in that category, while the rest of the country accounts for 4 million. (See Figure 2-3 in Chapter 2).

A significant increase in vitamin A deficiency nationally is seen in the first decade of new millennium, as it rose from 13% of the population being deficient to 54%. According to NNS 2011, vitamin A deficiency was lowest in AJK (44%), Punjab and Sindh (51%), and at least 15% above those levels in the other regions and provinces. Iron deficiencies appear to be almost exactly the reverse, as Punjab and Sindh have up to two times the proportions of inhabitants with iron deficiencies as do the other regions. Zinc deficiencies are higher for children in AJK (47%), KP (45%), and Balochistan (40%) than in rest of the country (39%).

Table 3-1: Infant Mortality and Micronutrient Deficiencies for Children under Five in Pakistan

	Pakistan		Punjab	Sindh	KP	Balochistan	GB	FATA	AJK
	NNS 2001	PDHS 2013	MICS 2014	MICS 2014	PDHS 2013	NNS 2011	NNS 2011	MICS 2009*	NNS 2011
Infant and Child Mortality									
Infant Mortality	-	74	75	82	58	49	71	86	
Under Five Mortality	-	89	93	104	70	59	89	104	
*Micronutrient Deficiencies **									
Vitamin A	13	54	51	51	69	74	72	100	44
Iron	67	33	49	49	14	33	20	26	27
Zinc	37	39	38	38	45	40	33	34	47
Vitamin D	-	40	40	40	29	43	37	26	35

*All of micronutrient deficiencies are taken from the NNS 2011, except for FATA, which comes from FDIHS 2015.

Beyond what is seen in the Table, research shows that nutrition generally improves with increasing access to education, WASH and higher socioeconomic status, typically found in urban areas, but urban children in Pakistan are found to be only marginally better off than rural children. The prevalence of micronutrient deficiencies is found to be over 50% even for the wealthiest socioeconomic strata in the cities, indicating that the problem is widespread across the country regardless of other associated factors that impact malnutrition. Overall, 98% of all children in the cities have at least one form of micronutrient deficiency, either from vitamin D, vitamin A, zinc or iron (GoP and WFP, 2016b).

3.2 Immediate Determinants

This section presents the situation of some of the immediate determinants of nutritional status, namely dietary intake and maternal health status. The subsection on dietary intake includes analysis of household eating patterns, micronutrient deficiencies among children, and supplementation.

3.2.1 Dietary Intake

Pakistan has the third highest number of stunted under five children in the world (WaterAid, 2016). In addition, more than 9.6 million Pakistani children have experienced chronic nutrition deprivation in utero and/or during early childhood (UNICEF, 2015). This severe situation is coupled with a rising tide of non-communicable diseases, pushing a double burden of disease onto the multi-tiered health care system in Pakistan. Surveys show that an estimated 40 million individuals in Pakistan suffer from high blood pressure, 32 million from heart disease, 24 million from obesity, 18 million from high cholesterol, and 8 million from diabetes (Wasay, Zaidi, and Jooma, 2014).

Dietary Diversity. Whether from unaffordability, unavailability or other factors, Pakistanis have limited dietary diversity, resulting in nutrient requirements not being met. Studies suggest that although 56% of households consume more than the average recommended level of 2,350 kcal per adult equivalent person per day, 68% of households in the four provinces (excluding GB, FATA and AJK) are unable to afford a minimum (staple adjusted) nutritious diet (GoP, 2017; GoP and WFP, 2016a). Moreover, 35% of households in Pakistan have very low dietary diversity, with around half of their energy intake coming from cereals alone (GoP, 2017). Surprisingly, low dietary diversity prevails even in the wealthiest quintiles. This lack of dietary diversity has severe implications, given the positive correlation between the unaffordability of a staple-adjusted nutritious diet and stunting (GoP and WFP, 2016a).

With regard to dietary intake of protein and micronutrients, preliminary results of a study being conducted under the Nutrition Section of the MoPDR shows that inadequacies in the intake of protein, zinc, and iron have increased since 2001. A supplementary analysis by IFPRI finds that while the average intake of protein and vitamin A falls just below the required daily amount, the average intake of iron, zinc, and calcium fall 30% to 40% short. This information is augmented by data from the 2017 Food Security Assessment for Pakistan (GoP, 2017), which reveals that 59% of households fall below the average requirement for vitamin A, 40% for iron, and 37% fall below for zinc.

Household Food Resource Allocations. Gender bias in intra-household resource allocation and thus in the levels of consumption could further distress the food security situation (Haddad et al., 1996; Nazli

and Hamid, 1999). However, due to limited data and literature, evidence on intra-household consumption patterns is a gap. Using data from IFPRI's Pakistan Rural Household Panel Survey (PRHPS, 2017) on family eating patterns[6] during normal dinnertime and on food allocation during food shortages, we find that a majority of households across rural areas of Punjab, Sindh, and KP normally eat together during dinnertime, as reported in Table 3.2.

Table 3-2: Normal Household Eating Practices (Evening Meals), 2014

	Overall	Punjab	Sindh	KP
	(Percentage of households)			
Everyone eats together	65.1	70.2	47.7	74.9
Household head eats first	12.2	10.7	16.4	11.1
Adult males eat first	12.0	7.8	22.8	13.1
Adult females eat first	0.3	0.4	0.0	0.0
Male children eat first	0.8	0.8	0.9	0.3
Female children eat first	0.1	0.1	0.0	0.0
All children eat first	7.1	6.7	11.0	0.3
Elders eat first	2.5	3.2	1.3	0.4
Total	100	100	100	100

Source: PRHPS, 2017

More interesting are the results for food distribution across provinces when shortages arise, shown in Table 3.3. For meat consumption, adult male members were given a higher priority in KP, while the fewest households gave meat to children first in any province. For milk, the majority of households in Punjab and Sindh gave a preference to children, while for fruit there was also a higher preference for either eating together or giving it to children first across all three provinces.

Table 3-3: Distribution of Priorities in the Case of Food Shortages (Percent), 2014

(Food Given to…)	Meat				Fruit				Milk			
	Overall	Punjab	Sindh	KP	Overall	Punjab	Sindh	KP	Overall	Punjab	Sindh	KP
Everyone together	37.4	40.3	29.2	33.2	37.4	39.8	27.8	34.8	37.4	37.5	24.4	33.7
Household head first	18.8	19.7	17.4	14.1	18.8	13.1	10.6	7.2	18.8	10.7	10.4	6.3
Adult males first	20.8	16.9	28.3	40.5	20.8	12.5	24.0	22.5	20.8	11.0	21.1	10.9
Adult females first	0.5	0.6	0.0	0.5	0.5	0.7	0.0	0.5	0.5	0.2	0.0	0.5
Male children first	2.2	2.4	1.7	1.1	2.2	3.5	3.2	1.7	2.2	5.3	4.4	2.2
Female children first	0.5	0.6	0.3	1.1	0.5	1.3	0.6	1.1	0.5	1.5	1.6	2.2
All children first	15.8	15.3	20.8	1.5	15.8	26.3	30.9	30.0	15.8	31.7	36.1	44.2
Elders first	4.0	4.2	2.3	8.0	4.0	2.8	2.8	2.2	4.0	2.2	2.1	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: PRHPS, 2017

These results show a preference going to the household head and male adults in the face of shortages, and very little going to adult females. However, while discrimination is certainly likely, it may be that

[6] Three female members of each household were asked about who eats first at dinnertime on a typical day, and who, in the case of a food shortage, gets food first (meat, chicken, fruits, milk, eggs and butter).

adult females are often in the kitchen and not as often part of the regular meal allocations. Also, of note is the fact that all children, regardless of gender, are given preference during shortages, particularly for milk and fruit. This seems to be a little at variance from the NNS 2011, as qualitative findings stated that "boys must get more food than girls because they have more responsibilities in future."

Also, in our consultations, some participants stated that "while the family sat down together at the meal time, food is served in order of seniority." In another qualitative study of the Department of Pediatrics and Child Health at AKU, it was revealed that discrimination in the quality of foods and its distribution is a household-level manifestation of non-egalitarian attitudes pervasive in the society, as earners in the family deserve higher honor. Women made comments like, "We usually grow unhealthy since childhood. Our brothers, fathers and husbands get more and the best part of food." "Even if not discriminated, men are often given the first choice at meal times." While food shortages do not seem to lead to different treatment between female and male children, the analysis does confirm these other findings in that adult women are likely to be the last served in the presence of shortages.

Given that nutritional needs and status can change dramatically in the first months and years of life, as seen in Figure 3.2, more detailed analysis is presented in the paragraphs below regarding the diet requirements and situation at different stages of a child's life until two years of age.

Nutrition from Age 0 to 6 Months. The prevalence of malnutrition begins early in life, possibly *in utero*, as is evident with 26% of children already stunted, 17% wasted and 29% underweight at the age of 6 months. The poor state of maternal nutrition during gestation and later lactation adversely affects an infant's growth and development. This negative impact happens because of intrauterine growth retardation and an absence of micronutrients during breastfeeding, particularly when 80% of an infant's iron and zinc reserves are accumulated in the last trimester of pregnancy. Furthermore, compromised maternal nutrition affects the composition of breast milk, as many nutrients are secreted in human milk at the expense of maternal reserves, especially micronutrients such as vitamins B_6, B_{12}, A, and D.

Pre-lacteal feeding (giving any food except mother's milk to a newborn before initiating breastfeeding), which happens at the beginning of the infant and young child feeding (IYCF) period, is practiced by more than 50% of mothers in Pakistan. Although an integrated part of the culture, research has shown that excessive pre-lacteal feeding is a major barrier to early initiation of and exclusive breastfeeding, and it also increases the risk of infection for the newborn. This tradition is most dominant in Punjab (86.3%) and least common in GB (9.8%). Interestingly and possibly as a consequence, GB has the highest rate of early initiation of breastfeeding, at 60%, while Punjab has the lowest rate, at 13%. Overall in Pakistan, the early initiation of breastfeeding declined from 40.5% in 2011 to just 18% in 2012-13 (NNS, 2011; PDHS, 2013). Exclusive breastfeeding rates have remained low and stagnant at 38%. In addition, the median duration for exclusive breastfeeding, contrary to the WHO recommendation of 6 months, is 0.7 month for boys and 1.0 month for girls (PDHS, 2013).

Children's Nutrition between the Ages of 6 and 23 Months. Proper nutrition requires that complementary foods be introduced soon after the first six months of life, but currently in Pakistan there is a strong dissonance between that norm and practice. According to the NNS 2011, although the

proportion of children between the ages of 6 and 23 months receiving solid or semi-solid complementary foods is 85%, these foods are introduced too early, contrary to WHO recommendations. In addition, data on dietary intake from the NNS 2011, when compared with daily energy requirements, revealed that children, as well as their mothers, are consuming only half of what they need.

Furthermore, while more than 60% of children meet the minimum meal frequency, only 22% consume the minimum acceptable diet (MAD). Variations are seen across provinces, with children in Balochistan having the lowest MAD ratio at 9.1% and highest in GB at 31% (PDHS, 2013). Combining all three recommended IYCF practices of MAD, Minimum Meal Frequency and intake of breast milk and milk products, prevalence is low at 15% for all children in Pakistan aged 6-23 months. This percentage is higher for urban compared to rural areas, and increases with mothers' level of education and wealth.

Meeting Nutritional Requirements through Supplementation. In the absence of adequate dietary practices, micronutrient requirements need to be met through. According to the PDHS 2013, only 7.6% of children aged 6-59 months received iron supplements in the last 7 days. Vitamin A supplementation and awareness seemed better, with 72.1% of children receiving a dose in the last 6 months. However, a disparity was seen across regions, with KP at 81.2% and GB at just 8.8% for vitamin A supplementation.

With regard to supplement intake among mothers, those with a higher education were three times more likely to receive a vitamin A supplement. Among pregnant women, only 25.3% took folic acid supplements and 35.6% took calcium supplements (PDHS, 2013). Similarly, 55% of pregnant women did not take iron supplements at all. Women with higher education and those belonging to higher income quintiles were more likely to take antenatal supplements.

3.2.2 Maternal Nutrition, Health Status and Health Seeking Behavior

Multiple factors, such as household economic status, women's education, employment and control over income, place of residence, age at marriage, marital status, dietary habits and intra-household food distribution are major determinants of women's nutrition and health status. Maternal nutritional status, beginning with preconception, is a key effect not only for the mother, but also on the health, wellness, and quality of life of their children. Pakistan has made progress over the past two decades on maternal health, as the Maternal Mortality Rate (MMR) declined from 400 deaths per 100,000 live births in 1990 to 170 in 2013, which shows that the rate dropped by more than half (57%) with an average annual decline of 3.6%. (WHO, UNICEF, UNFPA and World Bank, 2014).

Women, in particular, often face difficulties in accessing quality health care due to poverty, limited autonomy and financial dependency. Gains in the country's health indicators, across maternal, newborn, and child health (MNCH) and nutrition, have lagged behind other low- and middle-income countries. Complete and timely antenatal care (ANC) is a necessary component of successful pregnancy outcomes. While women have made progress seeking ANC, between 2006 and 2012 only a 2% increase (from 65% to 67%) was observed among women making one ANC visit nationally (PDHS, 2013).

While WHO recommends four or more ANC visits during pregnancy, nationally only 36.6% of pregnant women completed all four visits; however, this was an improvement from the rate of 28% six years ago (PDHS, 2013). The likelihood of seeking ANC increased with mother's education and wealth, and decreased with age and the number of children. Most women pregnant for the first time (84%) sought ANC, compared to 57% of women experiencing a higher birth order. Despite these improvements, a quarter of pregnant women seek no ANC. This proportion is highest in Balochistan at 56% and lowest in Punjab at 19.5%. Postnatal care remains low at 29% for all women in Pakistan (PDHS, 2013). When probed in the PDHS, a number of barriers emerge: more than half of women (53%) did want to go alone to a health facility; 40% stated that managing transport was an issue; 37% noted the distance to a facility; 30% cited financial reasons; and 18% stated not getting permission. Overall, 63% of women reported that one of these problems was an obstacle to seeking health care (PDHS, 2013).

There is also a large gap between wealth quintiles in receiving ANC. The ANC percentage in the richest quintile is nearly double the poorest quintile (97% versus 51%), and considerable variations in using skilled birth attendants (SBAs) also exists among wealth quintiles. Women in the richest quintile were more likely than women in the poorest quintile to have SBA. Only 30% of women in the poorest quintile received SBA against 85% in the richest. (PDHS, 2013). NNS 2011 also showed that women's average Body Mass Index (BMI) ranged from 20·6 kg/m^2 (95% CI 20·5 to 20·8) in the poorest decile to 26·5 kg/m^2 (26·3 to 26·8) in the wealthiest.

Box 3-1: The Lady Health Workers Program

Box 3.1: The Lady Health Workers Program

The "Lady Health Workers Program," is especially noteworthy in a discussion of health care seeking behavior, as they have mustered community participation through awareness and changed attitudes regarding basic issues of health and family planning. The key has been a comprehensive grass roots system for the provision of primary health care. Data from PDHS (2013) shows that overall 68% of women are aware of LHWs, with rural women being more aware (73%) than urban women (59%), who have other options for health care. Awareness regarding LHWs is highest in Punjab at 78% and lowest in Balochistan at 33.6%. Of those women who are aware of LHWs, 22% claimed not to have received services from them and only 4% cited receiving information on MNCH. In addition, MICS 2014 shows that 37.6% women reported being visited by a LHW in the past month in Punjab and 52.3% households reported being visited by a LHW in the past three months in Sindh (MICS-Punjab, 2014; MICS-Sindh, 2014).

The national health facility assessment report showed a lack of MNCH related staff, medicines, supplies, and functional equipment as a barrier to delivering services (GoP, 2012). Despite this, an increase was also seen in the proportion of women who delivered with a skilled health care provider from 39% in 2006 to 52% in 2012 (PDHS, 2013). These gains in care seeking behavior are in part attributable to education and awareness, where much improvement is attributed to the Lady Health Worker Program, as discussed in Box 3.1. While discussing health care seeking behavior, it is important to mention that only 48.2% of women opted for delivery in a healthcare facility, while the remainder delivered in their homes. Of those who delivered in a health care facility, 14.6% opted for the public sector, while 33.6% delivered in private sector health facilities.

Gains in the country's health indicators, across MNCH and nutrition, have lagged behind other low- and middle-income countries. Even with improved dietary intake during pregnancy, reaching optimal nutrient levels takes time, and hence the window to achieve optimal nutrient status has often passed. Furthermore, anthropometric measurements from the PDHS 2013 find 14% of pregnant women to be classified as underweight. The NNS 2011 finds widespread micronutrient deficiencies among both pregnant and non-pregnant women across the country. As shown in Table 3.4, there are only minimal differences in micronutrient deficiency levels between non-pregnant and pregnant women, so mothers enter pregnancy in a malnourished state without added nutritional preparation. The NNS 2001 reported a micronutrient deficiency for non-pregnant women, with only 6% suffering from vitamin A deficiency, but 45% with iron deficiency and 42% with zinc deficiency.

Table 3-4: Maternal Micronutrient Deficiencies (NNS, 2011)

Province/ Region	Vitamin A (Both Severe and Moderate)		Vitamin D		Calcium		Anemia	
	Pregnant Women (%)	Non-pregnant Women (%)	Pregnant Women (%)	Non-pregnant Women (%)	Pregnant Women (%)	Non-pregnant Women (%)	Pregnant Women (%)	Non-pregnant Women (%)
Pakistan	46	42	69	67	59	52	51	50
Punjab	44	42	71	66	63	52	49	49
Sindh	47	35	67	71	50	45	60	62
KP	76	66	64	61	68	74	30	35
Balochistan	61	55	44	55	67	63	50	49
AJK	32	14	73	73	13	8.2	43	41
GB	44	39	76	81	71	45	34	23

Source: NNS 2011

3.3 Underlying Determinants

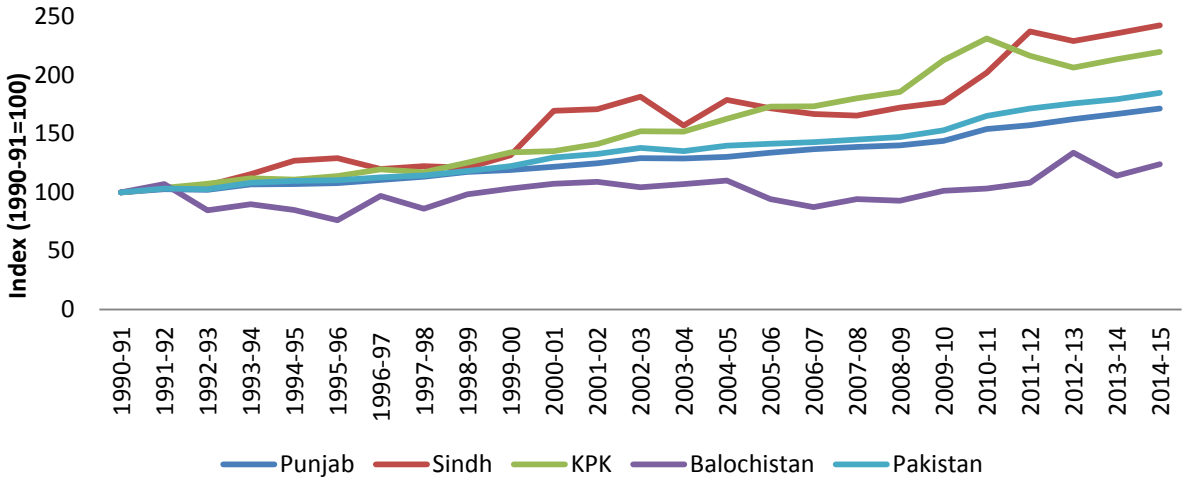
In this section, we use the UNICEF Conceptual Framework from Chapter 2 for *underlying determinants* to structure our discussion. These include three main determinants: food security resources; caregiver resources; and resources for health. The food security factors include availability, accessibility, and stability (including prices) of food resources. The provincial and regional consultations were structured according to these factors, as are the subsections below. This section also briefly examines access to health care facilities and females' health care-seeking practices.

3.3.1 Food Availability

The adequacy of food availability can be understood through an analysis of yield growth and associated per capita production. During the last 25 years, the population to be supported on each acre of land increased by 85%, and the food production needed to support that growing population has grown consistently. The pressure more than doubled in Sindh and KP, while the needed growth in Punjab was 71%, somewhat less than double. In Balochistan, it grew by only 24% (GoP, 2014c). The population to be supported on each acre is expected to further increase by 28% from 2015 to 2030. For long-term sustainable food availability, therefore, the output per unit of land should keep up with population

growth, but, as Figure 3.3 shows, it has lagged. Growth in crop yields in general, and especially in wheat (1.6%), did not keep up with population growth (2.4%)[7]. This is seen through the provincial disaggregation in Table 3.6, which shows declining rates, with the exception of Balochistan, in per capita availability of wheat.

Figure 3-3: Population Pressure on Cultivated Land, 1990–2015



Source: Agriculture Statistics of Pakistan (various issues) and Population Estimates from Population Census, 1998.
Note: The base value in 1990-91 is the population per unit of land in each province, which is set to 100 to show the percentage growth over the following years.

In Table 3.5 below, we forecast the impact of increasing yields on net trade of crop and milk production. We make 3 assumptions (1) the rate of population growth remains as observed in recent years (2) per capita availability remains fixed (at an average of the last 21 years) for 2013-2050 and (3) production technology remains the same, which leads to three different scenarios in the future. The first is a business-as-usual (BAU) scenario, in which yields grow at an annual rate based on the past 21 years. The second scenario presents a pessimistic situation, in which we assume that yields will grow by the lower rate mentioned in the Table. The third scenario presents an optimistic situation, in which growth, although higher than observed in recent years, are possible, and can be targeted by policymakers to meet demand.

Table 3-5: Projections of Net imports from 2013-2050

Scenarios	Wheat		Pulses		Rice		Milk	
	Yield Growth	% share of Net Trade to total production in 2050	Yield Growth	% share of Net Trade to total production in 2050	Yield Growth	% share of Net Trade to total production in 2050	Production Growth	% share of Net Trade to total production in 2050
BAU	1.8	13%	1.5	134%	1.6	-43%	5.5	-43%
Optimistic	2.5	-9%	2.5	70%	2.5	-57%	6.5	-47%
Pessimistic	1.5	25%	1	171%	1	-31%	2	-14%

[7]Thirty four year exponential growth rate of population and wheat have been taken from 1981 to 2014.

Source: Authors' calculations from Agriculture Statistics of Pakistan (various issues)
Note: A negative sign means net exports.

Pakistan may have to import wheat to meet its requirements in the BAU and pessimistic scenarios, with a share of imports to total production at 13% and 25% respectively. However, in the optimistic scenario, by 2050, Pakistan will become an exporter of wheat with a share of 9% of production. In the case of pulses, Pakistan will be a net importer in all scenarios. Increasing surpluses of rice and milk will allow for greater local consumption or more exports, which can give higher foreign exchange earnings. This assessment shows the importance of yield growths, and the possibility of agriculture adding to exports even with fixed acreage and a growing population.

While it is possible to rely on imports rather domestic production, several factors make the encouragement of Pakistan's agriculture important. Unlocking productivity in agriculture is essential to release resources that would allow the economy to transition to more industry and higher-level services, and at the same time reduce the cost of an adequate diet by lowering prices and expanding incomes in rural areas. Also, shifting to a technology and demand driven agriculture permits scarce government revenues in subsidies to be shifted to higher payoff options. Finally, investing effectively in agriculture can generate inclusive growth to meet rising demand, given the world's growing population and incomes (Saeed et al, 2017).

Table 3-6: Annual Growth Rates in per capita Domestic Wheat Availability

Provinces	*Per Capita* Growth Rates*
Punjab	-0.3
Sindh	-0.6
KPK	-1.3
Balochistan	0.1
Pakistan	-0.5

Source: Agriculture Statistics of Pakistan (various issues)
Note: *Per capita domestic production has been taken from 1986 to 2014 to show provincial disparities in wheat.

The provincial disaggregation in Figure 3.6 shows declining trends, except in Balochistan, where *per capita* wheat availability has increased by 0.1%. Pulses decreased by 1% per year in per capita availability from local production, with nearly 39% of demand met by imports

Table 3-7: Annual Growth Rates in per capita Food Availability from Production and Imports

Commodities	Net Availability*	Domestic Production**	Imports***
Wheat	-0.6	-1.2	-6.0
Rice	0.3	0.6	0.0
Pulses	0.6	-1.0	3.2
Meat	0.8	0.8	0.0
Milk	3.0	3.0 (Fresh)	6.7 (Dry)

Source: Agriculture Statistics of Pakistan (various issues)
Note: Calculations are based on two decades from 1993 to 2013. *Per capita net availability (domestic production + imports – exports – seed, feed and wastage) ** Per capita annual growth rates for domestic production *** Per capita annual growth rates for imports

. Per capita availability of milk increased by 3% due to added local production while imports of dry milk have increased by 6.7%, as shown in Table 3.7. Overall, these gaps in food availability contribute to stunting and other malnutrition, and leave nearly two-thirds of families unable to purchase a balanced diet (NNS, 2011; GoP and WFP, 2016a).

Specific topics in this area are investigated in Chapter 4, which include the changing structure of farms, agricultural productivity growth driven by increases in input use rather than technical change, the need for higher cropping intensity, greater research and development (R&D), and more crop diversification, which impact crop productivity, food diversity and affordability that affects Pakistan's food security.

3.3.2 Food Accessibility

Ensuring an adequate supply of food is necessary, but not sufficient, to achieve food security when households do not have adequate resources to obtain appropriate foods for a nutritious diet (Capone, 2014). The second dimension of food security deals with the economic and physical dimensions of food accessibility, which are examined in detail in this section.

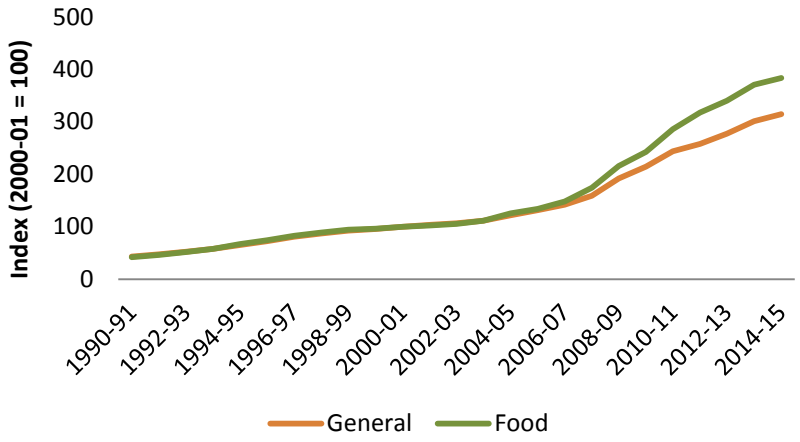
3.3.2.1. Economic Accessibility

Economic accessibility requires that an adequate and nutritious diet is affordable without compromising other basic individual and household necessities. Per this definition, almost one in every three Pakistanis does not have economic accessibility, as 29.5% of the population falls below the 'cost of basic needs' poverty line. Similarly, the MPI, which accounts for the dimensions of health, education, and standards of living, finds poverty to be even more severe, with a headcount of 38.8% (GoP, 2016a). Based on the Food Security Assessment, it is further the case that two out of every three households in Pakistan are unable to afford a balanced nutritious diet (GoP and WFP, 2016a).

Income and market prices play a significant role in determining economic access to food. Per capita real incomes have been stagnant in Pakistan, as they have in much of the world, and have yet to fully recover to pre 2007-08 levels (GoP, 2016b). International food prices have come down after peaking in 2011-12, but prices in Pakistan continued to grow until very recently. Since 2004-05, the domestic price for wheat has increased by 193%, fresh milk by 266%, beef by 234%, potatoes by 73%, and dry onions by 239%[8]. Compared to other prices in the country, food prices have accelerated more quickly since 2007, thereby penalizing those who spend higher proportions on food. (See Figure 3.4.)

[8] Percentage change in prices between 2004-05 and 2015-16, as reported in Economic Survey of Pakistan.

Figure 3-4: Trends in Domestic Price of Selected Food Commodities, 1990 - 2015

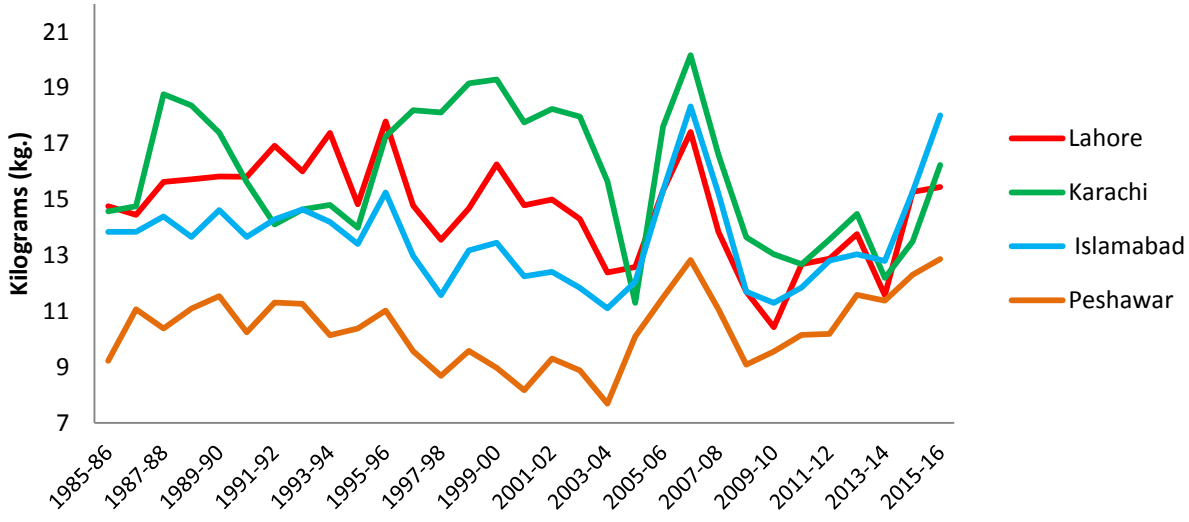


Source: Economic Survey of Pakistan (various issues)

With higher food prices, wages must grow to maintain purchasing power. The nominal daily wages of unskilled labor more than tripled between 2004-05 and 2015-16, and so they have in general grown faster than most food prices. However, due to year-to-year food price volatility, there have been large fluctuations in affordability. For example, Figure 3.5 shows that an unskilled laborer in Lahore could afford 17.4 kilograms of wheat with his/her daily wage in 2006-07, but could only afford 10.4 kilograms three years later in 2009-10. Affordability has improved in more recent years.

The lack of affordability has clear implications for malnutrition and micronutrient deficiencies, as a positive correlation has been found between stunting rates and unaffordability of a staple adjusted nutritious diet (GoP and WFP, 2016b). Given higher unemployment and poverty rates, especially in rural Pakistan, the sources of livelihoods and determinants of income in rural areas must be examined. Box 3.2 touches on these issues for rural Punjab, Sindh, and KP (GoP and WFP, 2016b).

Figure 3-5: Kilograms of Wheat Flour Affordable per One Day's Wages, 1985 – 2015



Source: Economic Survey of Pakistan (various issues)

Box 3-2: Income Diversification in Rural Pakistan

Box 3.2: Income Diversification in Rural Pakistan

Data from IFPRI's Pakistan Rural Household Panel Survey (PRHPS, 2017) show that rural households typically derive income from several sources, such as farming, wages and salaries, non-farm business, pensions, remittances, rent, and aid and assistance. Households with less than five acres of land often derive their livelihood not only from farming and livestock but also through nonfarm economic activities, while larger farms obtain most of their income from crop and livestock activities. Livestock is an important source of income not only for farm households but also for nonfarm households.

Results based on econometric modeling show that household income can be improved by investing in human capital, better nonfarm employment, improved access to information, and improved infrastructure. The impact of female education is found to be significant, indicating the importance of their education and participation in economic activities.

Social Protection. According to the World Bank (2013), investment in social protection can be effective in reducing poverty, and the presence of an effective social safety net allows policy makers to avoid inadequate policies (such as price subsidies) that may interfere with the functioning of markets (World Bank 2013). As per the Economic Survey, the government focused on 17 sectors in its *Poverty Reduction Strategy Paper II* (PRSP-II), which include education, health, a variety of infrastructure areas such as water and sanitation, and a number of social protection programs. Also, after the 18th constitutional amendment was passed in 2010, expenditures increased in the areas of poverty reduction, health, and nutrition by about 1% of GDP from previous levels (Davies et al., 2017).

The major direct social protection program is BISP[9], launched in 2008, in which provincial and federal governments made expenditures of about 5.6% of total PRSP investments. BISP also receives funding from the World Bank, the Asian Development Bank (ADB), and United States Agency for International Development (USAID) and the United Kingdom's Department for International Development (DFID). The government has increased budgetary allocations from PKR 26.6 billion in FY2019 to PKR 115 billion in FY2016. The provinces appear to be adding funds in recent years to BISP as well. The total number of BISP beneficiaries grew from 1.76 million in 2008-09 to 5.3 million by the end of 2016-17. According to a study by the World Bank, the BISP's targeting performance falls among the top five social protection programs in the world (Honorati, Gentilini, and Yemtsov, 2015).

The core BISP program currently provides unconditional cash transfers of PKR 1,567 per month (PKR 18,800 per annum). The Program has also launched four supporting components (some of them currently in a pilot phase): (i) *Waseela-e-Rozgar* (Technical & Vocational Training); (ii) *Waseela-e-Haq* (Microfinance); (iii) *Waseela-e-Sehat* (Life & Health Insurance) and (iv) *Waseela-e-Taleem* (Primary Education). These components range from conditional cash transfers for school enrollment to demand-driven vocational training programs designed to be a graduation strategy for BISP beneficiaries.

[9] Based on the development of a National Socioeconomic Registry through a Poverty Scorecard Survey, the short-term objective of the program is to cushion the adverse impact of food, fuel and financial crises on the poor, but its broader objective includes meeting the targets set by the SDGs to eradicate extreme and chronic poverty and improve the empowerment of women.

Until the introduction of BISP, Pakistan's safety net system comprised primarily of two cash transfer programs: *Zakat* and the Food Support Program administered by the Pakistan *Bait-ul Mal*. These programs were established to alleviate poverty by providing financial assistance to destitute women, widows, orphans, and other needy persons. A total of PKR 5.30 billion was distributed to federal, provincial and other poverty reduction programs 2016-17 (GoP, 2016b). Other programs exist as well, such as those run by the Pakistan Poverty Alleviation Fund, which contributed about PKR 16 billion (Economic Survey), and the recently launched National Health Insurance Program, which aims to benefit 10 million people across the country in the first phase. Finally, many agricultural subsidy programs are social protection programs for certain groups (Davies et al., 2017). Total direct subsidies, both federal and provincial, are about PKR 56 billion, excluding allocations to the Pakistan Agricultural Storage and Services Corporation. Another PKR 336 billion goes into indirect support for agriculture each year.

3.3.2.2 Physical Accessibility, including WASH

Physical accessibility mainly pertains to remoteness as it affects food security. However, for this report we extend the scope to cover physical access to all basic services, which may directly or indirectly impact food security, including access to WASH facilities, which are conventionally covered under utilization.

Physical Remoteness. Limitations in physical accessibility in some remote areas of Pakistan, especially in parts of Balochistan, AJK and GB and KP, were often mentioned in the provincial consultations. These areas have rural economies, with most inhabitants landless or with small holdings, and facing limited local economic opportunities, so they rely heavily on internal migration of male household members for employment. A majority of households in such areas have limited purchasing power, and therefore limited consumer demand. Large markets in these areas fail to flourish, as high transportation costs are an additional deterrent.

Physical Infrastructure, Urbanization and Basic Services. Pakistan has seen major improvements in physical infrastructure over the last five decades. More than 90% of villages are now electrified; cellular phone coverage is extensive; over 65% of the population is estimated to be within three hours of a city of 500,000 or more; and urbanization has increased at a rate of 3.5% annually (Nazli et al, 2012; Kedir, Schmidt, and Waqas, 2016). However, some deficiencies remain, with low availability in rural parts of the country (between 10-20%) of other basic services, such as natural gas for cooking, sewerage, and garbage disposal systems (Nazli et al, 2012). In the absence of gas, firewood and animal/plant residue are used for cooking and heating, which can lead to indoor air pollution with negative health impacts, particularly on female household members who are traditionally responsible for cooking.

WASH. Improvement in sanitation facilities has been substantial over the years, with Pakistan achieving the MDG for sanitation by halving the proportion of households without sustainable access to basic sanitation. However, 41 million Pakistanis are still practicing open defecation, the third highest number of people in any country, behind India and Indonesia (WHO/UNICEF, 2014).

Although a high percentage (89%) of households in Pakistan have access to an improved (mainly covered) sources of drinking water, majority (90%) do not treat drinking water at all and only 8% of households use an appropriate water treatment method (PSLM, 2014-15; PDHS, 2013). A recent study

conducted by the Pakistan Council of Research in Water Resources showed that out of the 72% of water supply schemes in the country that are functional, 84% supply water that is not fit for consumption. In addition, 14% of water supply sources in Punjab and Sindh were heavily contaminated with arsenic.

With regard to hand washing, as many as one in every three individuals in Balochistan and GB still have no access to water, soap, or any other cleaning agent. Great disparities among wealth quintiles are also evident, with only 16% of households in the lowest quintile having access to soap and water compared with 98% of households in the highest quintile (PDHS, 2013). Furthermore, around 48% of schools in the country do not have the basic facilities required for adequate hygiene, such as toilets, boundary walls, electricity and drinking water (Alif Ailaan, 2016). This lack of access to safe drinking water and sanitation facilities, as well as poor hygiene practices, not only is a major contributor to comorbidities like diarrhea and pneumonia, which adversely impact a child's nutritional status, but also has negative implications for school attendance, especially among girls after they reach puberty.

Marketing and Distribution Systems. A well-functioning marketing and distribution system not only raises the physical and economic accessibility of food, it is also where fortification is added, where the nutritional value of food is enhanced or, more often, deteriorates, and where much potential to increase affordability can be found.

At present, losses in the distribution system are high in Pakistan. It is estimated that out of the total production of fruits and vegetables, about 35-40% goes to waste, which includes 10-12% loss during transportation (GoP, 2009; Government of Punjab, 2012). This is further exacerbated by the finding that a scarcity in storage and transportation infrastructure leads to 25-40% in post-harvest losses, which shrinks supply and put pressure on prices (Aujla et al, 2007). At farm level Ahmedani et al. (2011) observed that more than 20% of weight loss occurred in seeds after a storage of 6 months under natural conditions. In addition, according to the International Finance Corporation, the bottom layer of bags stacked in *ganjis* (pyramids-shaped stacks in the open-air covered with tarpaulin) suffers 50% damage after three months, and is 100% damaged after six months. It is thus not surprising that monetary losses incurred by the government in wheat procurement and storage were about 13% of total costs in 2010-11 (Prikhodko and Oleksandr, 2013).

3.3.3 Sustainability of Food Security and Nutrition

Natural Disasters and Climate Change. Emergency situations created by floods, droughts and earthquakes, exacerbated by climate change, are major elements of Pakistan's natural environment that challenge the sustainability of agriculture and associated livelihoods, and thus food security. Pakistan continuously ranks among the most affected countries in various climate risk indices. In the Long Term Climate Risk Index, Pakistan ranked 8th highest in 1995-2014 and 7th highest for 1996-2015 (Kreft, Eckstein, and Melchior, 2016).

Pakistan has faced many severe floods since its founding in 1947. The financial loss from 1950 to 2009 due to floods is estimated to be PKR 2.0 trillion; 8,887 people lost their lives, and an area of approximately 407,132 square kilometers was affected (GoP, 2011). For the floods of 2010, which are

recorded to be the most damaging in the past 80 years in the entire region, the country suffered an overall loss of PKR 1.0 trillion, equal to half the costs from 1950 to 2009. Sindh suffered the highest financial loss (PKR 440 billion), followed by Punjab (PKR 260 billion), KP (PKR 120 billion) and Balochistan (PKR 62 billion). The extent of damage in AJK, GB and FATA was smaller. The GoP allocated PKR 680 billion for reconstruction of the most damaged sectors—agriculture, housing, transport and communications—and PKR 410 billion for added development (GoP, 2011).

To deal with climate-related issues, the GoP has created the Ministry of Climate Change to assess and insure against threats imposed by global warming and to protect the environment. To deal with natural disasters, the National Disaster Management Authority (NDMA) was established under the chairmanship of the Prime Minister to give advice on policies related to disaster management. International organizations such the UN Office for the Coordination of Humanitarian Affairs (OCHA), WFP and FAO are also continuously monitoring the humanitarian situation and providing relief programs as needed.

Man-Made Disasters. The relationship between man-made disasters—such as conflicts and violence — and food security is complex and dynamic. Research finds food insecurity to be both a cause and consequence of conflict and violence (Breisinger et al., 2014; Rama et al., 2015). Such events often reduce food availability and access when agricultural production and markets are disrupted or when livelihood opportunities are affected. Food insecurity, on the other hand, can further trigger an array of undesirable responses.

For more than a decade, Pakistan has been facing challenges related to instability in FATA. Resultantly, the region witnessed severe levels of food insecurity (FAO, 2015a). While the situation in FATA is improving over the years following a successful military operation, over 5.3 million people have been displaced since 2008 (SATP, 2017). Of these, 4.8 million have returned, albeit many unwillingly due to concerns over livelihood opportunities and basic services. With regard to food security status, households mainly depend on daily wages as a source of income due to low agriculture and livestock productivity, thus leaving them highly vulnerable to food insecurity (WFP/FAO/IRC, 2015). Moreover, not only does a majority of the population have borderline or poor food consumption[10], two out of three households in the region require loans to meet dietary needs. Access to WASH facilities is also of serious concern. Moreover, female headed households are worse off in all ways.

The government, with development and humanitarian partners, has taken commendable steps to ensure food security of those affected by man-make disasters through measures such as foodstuff provision as well as cash grants. Recently a sum of PKR 80 billion was earmarked by the federal government for the rehabilitation and reconstruction of health, education and other basic facilities in FATA, while in 2016 the WFP signed an MoU to spend PKR 13.2 billion over the next three years on nutrition, stunting, and Community Management of Acute Malnutrition (CMAM); school feeding; nutrition support for pregnant and nursing mothers; livelihood support under their Food For Assets (FFA) project; and support and rehabilitation of returnees through cash-based transfers. In addition,

[10] As measured through the Food Consumption Score, which looks at dietary diversity and meal frequency.

funds are also available under the Multi Donor Trust Fund, which is one of the largest donor pools, created to fund reconstruction and rehabilitation efforts in different areas of the country, contingent on timely approval of respective PC-1.

3.4 Basic Determinants

This section outlines some of the main constraints on food security and nutrition, derived from a review of *basic determinants.* These basic determinants include Pakistan's resources and economic structure; population and urbanization; governance instability; the role of government and institutions, especially social protection; and gender-related factors.

3.4.1 Potential Resources and Economic Structure

Over the past decade, Pakistan grew into a middle-income country, with the services sector being the largest part of its economy (59.2% of GDP), followed by the industrial sector (21.0%) and agriculture (19.8%). Agriculture's share of GDP used to be higher—53% in 1950—but by 1990 it had declined to 25% and then to the current level of less than 20%. While a structural transition away from agriculture is expected with development, Pakistan has shifted to an unusually high proportion of services due to a lack of growth in industry. This lack of industrial growth has had serious implications, most notably a lack of export diversification and a trade deficit that has grown more than 10-fold since 2000-01.

Changing sectoral composition, as seen in Pakistan, is usually accompanied by growth in per capita GDP. Thus, growth in general is poverty-reducing and should improve food security and nutrition. However, Pakistan's poverty levels are still high, so not all growth is equally inclusive and poverty-reducing. IFPRI research suggests that agriculture, along with health and education, have the greatest potential to reduce poverty (Saeed, 2017). Pakistan possesses significant natural resources that present opportunities to support agricultural growth: a varied landscape; different cropping zones; and the vast irrigated Indus River Valley, which accounts for 80% of the country's agricultural output, including commodities that drive its industry (cotton textiles accounting for 50–60% of exports). Moreover, Pakistan has rangelands, significant coastlines to support fishing, unexploited reserves of gas, coal and other minerals, as well as a strategic location within Asia that may soon be exploited under the USD 54 billion "China Pakistan Economic Corridor" (CPEC) investment program.

3.4.2 Population and Urbanization

Pakistan is currently the sixth largest country in the world in terms of population and, with an exponential population growth rate of 2.4% over the past 34 years it is projected to become the third largest country by 2050. An estimated 64% of the population is below the age of 30. UNDP's 2016 Human Development Report for Pakistan predicts that this group could be at a risk of becoming marginalized and unable to contribute to the economy if the right strategies and policies are not put in place soon to meaningfully engage youth in their communities, deliver quality education and secure future livelihoods. The current situation however, looks problematic. Although public expenditures on education are estimated to double from 2.2% of GDP in FY2015 to a target of 4.0% of GDP by 2018 (GoP, 2016b), this investment remains insufficient. Studies predict that under the current spending and

policies, it will take until 2076 to achieve full enrollment rates (Nasir, 2016). An added challenge is the need to create 1.5 million jobs each year until 2040 to sustain the increasing workforce (GoP Vision, 2025).

While the population of Pakistan is increasing at a dramatic rate, so is urbanization. Estimates show that Pakistan has the highest urbanization in the region; nearly 40% of Pakistan's population is urban[11], compared to 33% to 34% in Bangladesh and India. Projections show that in the next 10 to 15 years, half of the country's population will be living in urban areas. Sindh will be the most urbanized province, with 60% urbanization, followed by Punjab, at 50% urban. KP and Balochistan are projected to be 41% and 46% urbanized respectively (Jan and Iqbal, 2008).

This urbanization is a mixed blessing. Urban areas contribute 80% of Pakistan's GDP, almost all its tax revenues, and 60% of its employed labor force. The urban poverty rate is almost half the rural rate, and per capita income levels and growth rates have been relatively higher in urban areas. Literacy and school enrollment ratios for both urban men and women are also better. A reasonable transportation network between major cities helps link rural goods to peri-urban manufacturing and services, and facilitates national and international trade. However, urbanization in Pakistan, as in any developing country, comes with issues such as unemployment, conversion of agricultural to residential land, and insufficient public services and infrastructure. It also poses environmental challenges, such as water contamination, waste management and sanitation, and many communicable diseases, such that the urban poor are often in nearly the same position with regard to nutritional status as are poorer rural inhabitants (GoP and WFP, 2016b). Furthermore, urbanization in developing countries raises a triple burden of malnutrition—the coexistence of hunger (insufficient caloric intake to meet dietary energy requirements), undernutrition (prolonged inadequate intake of macro- and micronutrients), and over-nutrition in the form of overweight and obesity (Fan, Cho, and Rue, 2017).

3.4.3 Volatility and Instability

Since its independence in 1947, Pakistan has endured a volleying exchange of governing structures between democracy and military leaderships, but is now finally close to achieving the second consecutive full term by a democratically elected civilian government. While the situation has improved significantly in the recent years, the military operations in FATA, tensions along the Line of Control in Kashmir and other security threats have consumed time and expenditures of the state. In 2010, the 18th amendment to the constitution brought Pakistan from a semi-presidential state to a parliamentary republic, and this change played a vital role in decentralizing power. Recently steps were taken to rename the Federally Administered Northern Areas (FANA) as GB and to bring the FATA into the jurisdiction of KP. The 18th amendment also delegated agriculture, education and health as explicitly provincial domains. With resultant cuts in federal spending, 49 agricultural projects worth PKR 132.4 billion were dropped, causing a loss of momentum, which fortunately appears to have picked up again.

[11] The Planning Commission of Pakistan estimated that 37% of the population lived in urban areas in 2010. However, these estimates are calculated using definitions of urban within administrative boundaries.

In agriculture, expensive programs like wheat procurement and fertilizer subsidies have continued, possibly due to the political benefits of such subsidy programs (Davies et al., 2017*).*

3.4.4 Government and Institutions' Engagement in Food Security and Nutrition

Historically, food security and nutrition have had a low political visibility, but this situation appears to have changed since 2010. The current administration has placed food security in its Vision 2025 document, which is a promising sign. (See Box 3.3 below.) Pakistan also became a signatory to the Scaling up Nutrition (SUN) movement in 2013. The SUN movement advocates that all people have a right to food and good nutrition and brings together diverse stakeholders from governments, civil society, donors, researchers, and the private sector with efforts directed towards improving nutritional status of the population.

Box 3-3: Vision 2025 Pillar IV

Box 3.3: Vision 2025 Pillar IV – Energy, Water and Food Security: Pakistan Vision 2025 seeks a Pakistan where "all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life". Pakistan Vision 2025 envisages food security in the context of the entire supply-chain from production, processing, storage and distribution to consumption.

The development of the Pakistan Integrated Nutrition Strategy (PINS) in 2011 facilitated cross-sectoral action on nutrition, while the floods of 2010 and afterwards and findings of the NNS 2011, helped draw attention to the dismal state of maternal and child nutrition. The PINS linked government line departments at the provincial level with ministries at the federal level to encourage nutrition sensitive inter-sectoral planning and implementation, rather than confining nutrition to the health department.

As a result of the 18th amendment, the provinces also have taken various steps to improve food security and nutrition, as MSNS have been developed so that relevant departments are brought together to take on either *nutrition specific* interventions or *nutrition sensitive* ones. These include departments of health, education, food, agriculture, livestock, public health, population and social welfare. In Punjab and Sindh, the provincial P&D departments have set up nutrition cells, appointed focal persons and written PC-1s. The process in Sindh is being implemented under its Accelerated Action Plan. Over the past several years, federal and provincial governments also have put forward a number of policies related to food security and nutrition (see Table 3.8 below), with particular acceleration after 2011. Furthermore, a draft National Agriculture and Food Security Policy has been prepared by the Ministry of National Food Security and Research to improve agriculture production and food availability in Pakistan, while the MoPDR has developed the national MPI based on three dimensions, namely education, health, and living standards.

3.4.5 Gender-related Factors for Food Security and Nutrition

Female labor force participation in the country is only 25%, which is the lowest in South Asia and far lower than the regional average of 32% (LFS, 2013-14). The wage gap between men and women is 39%, escalating to over 50% in agriculture, forestry, and fishing. These disparities are worrisome, since women in Pakistan make up 39% of the labor force in agriculture, forestry, and fishing, with approximately 74% of total female employment dependent upon agriculture, as compared to 34% of the

male employment. In addition, women are less likely to own income-generating assets such as land, agricultural equipment, and livestock or have a say in the household's production and other decisions. Reasons include traditional gender-based roles and expectations, along with local inheritance practices.

Table 3-8: Policies Related to Food Security and Nutrition

	Policy	Year	Details
1.	Pure Food Ordinance	1960	Amends the law in relation to the preparation and sale of foods
2.	Pakistan Pure Food Laws (PFL)	1963	
3.	Pakistan Hotel and Restaurant Ac	1976	
4.	Pakistan Standards and Quality Control Authority (PSQCA) Act	1996	
5.	Forest Policy	1999	In Implementation
6.	Protection of Breastfeeding and Child Nutrition Act	2002	Endorsed by Punjab (2012), Sindh (2013), Balochistan (2014), and KP (2015)
7.	Balochistan Integrated Water Management Policy	2005	Integrated into projects, e.g., Balochistan Integrated Water Resources Management and Development Project
8.	Pakistan Integrated Nutrition Strategy (PINS)	2011	Designed as a strategic framework to guide provinces in defining nutrition in their provincial post-devolution development agendas
9.	Punjab Food Authority Act	2011	To provide for the safety and standards of food and for establishment of the Punjab Food Authority
10.	National Climate Change Policy	2012	In Implementation
11.	Rangeland Policy	2013	In Implementation
12.	KP Food Safety Authority Act	2014	In Implementation
13.	FATA Sanitation Policy	2014	Approval Phase
14.	FATA Drinking Water Policy	2014	Approval Phase
15.	FATA Agriculture Policy	2014	Approval Phase
16.	Early Marriage Restraint Act	2014	
17.	Balochistan Food Authority Act	2014	
18.	Seed (Amendment) Act	2015	Rules of Implementation being developed
19.	Plant Breeder's Rights Act (PBRA)	2015	Rules of Implementation being developed
20.	Multi-sectoral Nutrition Strategies and PC-1s	2015	Drafted within the scope of Pakistan Vision 2025
21.	Punjab Pure Food (Amendment) Ordinance	2015	To amend the Punjab Food Authority Act, 2011, for categorization of food business premises, enhancing punishments, and other purposes
22.	Punjab Livestock Policy	2015	In Implementation
23	KP Agriculture Policy	2015	In Implementation
24	KP Breast Feeding and Child Nutrition Act	2015	In Implementation
25	KP Climate Change Policy	2016	In Implementation
26	KP Biodiversity Action Plan	2016	In Implementation
27	National Forest Policy	2016	Developing action plan for its implementation in consultation with provinces
28	Punjab Pure Food (Amendment) Act	2016	Act amended to include food fortification
29	Punjab Land Records Authority Act	2017	Pilot project implemented in Kasur District
30	National Water Policy		Approved by Inter Provincial Coordination Ministry (January 2017), awaiting Council of Common Interest (CCI) approval
31	Iodine Deficiency Disorders (IDD) Control Bill		Drafted in 2009 but not converted into legislation. Currently, only GB (2011), Sindh (2013), and Punjab (2015) have compulsory iodization of salt, but implementation is poor.

Only 5% of farm households are headed by women and, of these female-headed households, 89% are marginal farms (less than 5 acres of land) and 9% are small farms (between 5 and 12 acres of land) (HIES,

2013-14). Cultural factors in parts of the country have limited female education and empowerment and can be argued to have hindered economic progress. Only 2% of women receive financing for agriculture activities. Among those women employed in agriculture, 47% are involved in animal production, 23% are engaged in mixed farming, 18% grow non-perennial crops, and 11% are involved in support activities, including harvesting. All of these women are employed below the minimum wage.

Many studies show that investing in women's education, health, income, and decision-making power creates positive externalities for food security and nutrition, and the incidence of undernourishment in children can be reduced by half when mothers received primary education (Alderman and Garcia, 1993). Other studies on Pakistan associate women's decision-making power with household budget shifts towards children's clothing and education, and especially girls' enrollment in school (Hou, 2011). Women are also found to spend more appropriately on food consumption than men, and families eat more non-grain food items and consume better calories. Calculations using the HIES 2013-14 data show that overall, female headed households tend to be less calorie deficient relative to male headed households.

4 ANALYSIS AND RECOMMENDATIONS FOR FOOD INSECURITY AND NUTRITION

4.1 Gaps in Food Security and Nutrition

The first section discusses six topics related to both nutrition and food security, namely policy and institutional gaps, cost-benefit analyses related to malnutrition, data limitations, approaches to find fiscal space, food accessibility, and gender dimensions. The next two sections are specific to food security, followed by nutrition. Each of these sections follows the conceptual framework introduced in Chapter 2, addressing gaps related to both immediate and underlying determinants. Gaps specific to each region are reported in the appendices.

4.1.1 Gaps Related to Both Food Security and Nutrition

4.1.1.1 Policy and Institutional Gaps

In terms of policy, significant steps have been taken in the right direction since civilian governments were elected in 2008. As described in Chapter 3, the drafting of many needed policies has accelerated significantly in recent years. However, legislation relating to food security is still lacking, as several important policies have become stuck in the draft stage (See Box 4.1).

With regard to nutrition, there has been significant progress in policy development since devolution in 2010 (based on the 18th constitutional amendment), particularly after the floods of 2010 and 2011, which drew attention to the dismal state of maternal and child under-nutrition during recovery efforts. As part of the SUN movement and the PINS, provincial governments have developed and endorsed MSNSs, which are at varying stages of development towards integrated PC-1s. A number of laws that are important for nutritional outcomes have also been enacted over recent years relating to food quality, salt iodization, breastfeeding and child nutrition, and most recently restraint of early marriage, which helps prevent the adverse nutritional and health outcomes of motherhood in adolescence (Turab, Tahir and Zaidi, 2017). Also in the past decade, a series of new institutions relating to disaster management, poverty reduction and nutrition delivery have been created and funded. However, there are still broad policy and institutional gaps as well as inconsistencies across provinces and regions (See Box 4.1).

During regional consultation meetings, stakeholders consistently expressed concern about the limited inter- and intra-sectoral coordination and cohesion concerning nutrition within the public and private sectors. Primary bottlenecks identified were the absence of a permanent home for nutrition, the low priority given to nutrition in the development agenda so far, and meager budgetary allocations, although these issues seem to be improving with the recent development of provincial MSNSs and PC-1s, and activities undertaken under the SUN movement. However, even if adequate policies are put in place, major implementation gaps still must be addressed. For example, there are widespread problems in food quality due to a lack of monitoring. In the milk and dairy sector in particular, heavy metal contamination and the presence of aflatoxins have been found consistently in various districts (Younus et al., 2013; Hussain et al., 2010). This gap remains despite legislation governing issues of food quality

and safety, such as the Pure Food Act and provincial Food Authority Acts. This lack of implementation comes from a lack of regulatory frameworks and inadequate or absent institutional bodies.

Box 4-1: Specific Policy and Institutional Gaps in Food Security and Nutrition

Box 4.1: Specific Policy and Institutional Gaps in Food Security and Nutrition

Food Security

- Only KP has an agriculture policy in place. Other regions' policies are in various stages of development and need to be finalized and approved.
- The seed sector, which is in need of major reform, had the Federal Seed Act and the Plant Breeders' Rights Act approved in 2016. However, rules of business still need to be developed.
- Pakistan still awaits a national water policy, despite efforts since 1991 and renewed efforts in 2012. A draft policy remains unapproved, since the water sector is subject to provincial contention, inequitable distribution among farmers and regions, and issues of sustainability.
- The market for land is dysfunctional due to an obsolete land records management system. However, KP and Punjab are making renewed attempts toward computerization of land records (and including geo-tagging and soil sampling to add further improvements).

Nutrition

- At the MoPDR , nutrition is under "Climate Change, Food and Agriculture".
- At the provincial and regional levels, institutions for nutrition are built around the MSNSs. This is a good starting point, but the MSNS does not yet have needed interactions with agriculture or food departments outside relatively small projects.
- The MSNS appears to be well placed in provincial P&Ds and to have organized structures, but it is not yet clear whether this multi-sectoral approach will add significant value to the quest for better nutrition outcomes.
- Integrated PC1s for MSNSs are not in effect in FATA, GB or AJK.
- The Early Marriage Restraint Act only passed in Sindh and in amended form in Punjab, and its implementation is weak.
- The Protection of Breastfeeding and Child Nutrition Act lacks rules and procedures for implementation, despite the establishment of Infant Feeding Boards at the provincial level.
- Long-term nutrition efforts were not a priority in the FATA Sustainable Development and Return and Rehabilitation Strategy. The strategy's focus was on short-term nutrition programming to address acute malnutrition for temporarily displaced persons.

In general, policy implementation failures arise due to one or more of the following gaps.

- First, inadequate funds are budgeted and/or allocated for implementation to occur. At this point, financial and long terms commitments to nutrition by the provinces appear to have grown stronger, but remain insufficient. There is a need for government structures that can mobilize funds and evaluate and redirect activities and human resources to investments that will yield the highest payoffs. Since food security and nutrition relate to a number of government departments (agriculture, food, and health), cross-cutting evaluation of budgets is needed.
- Second, technical and capacity building support are lacking by provincial governments to scale up evidence-based interventions and programs that are in a pilot phase.

- Third, institutional structures or rules of business have not been established.
- Fourth, methods for enforcement and accountability are lacking, as are effective systems for M&E to ensure sustainability over time.

4.1.1.2 Cost-Benefit Analyses of Undernutrition

Economic Cost of Undernutrition. Undernutrition incurs large monetary costs to the economy, stemming from higher mortality/premature death, higher incidence of illnesses, and lower productivity. Undernutrition among children also incurs costs related to education due to poorer school performance and a higher incidence of grade repetition. The total cost of undernutrition in Pakistan is estimated to be as much as PKR 511.5 billion to PKR 704.3 billion per year (Saeed et al., 2017; Bagriansky, 2017). Of these costs, the health and education costs make up PKR 7.8 to PKR 12.5 billion, so the bulk of the cost is due to loss of life and productivity.

The lower estimates are based on "disability adjusted life years" (DALYs) lost from undernutrition due to premature death and years lost living in suboptimal health. Hence, one DALY represents the loss of one year of full health. WHO estimates that nutritional deficiencies in Pakistan in 2015 caused a total loss of about 2.8 million DALYs, from which we estimate a loss of GDP in the range of PKR 511.5 billion. The advantage of using the DALY database is that it identifies specific nutritional deficiencies and the loss of life years. Table 4.1 shows that the bulk of DALYs lost and economic loss (75%) are the result of iron-deficiency. The second largest cause of DALYs lost (18%) is protein-energy malnutrition. In contrast, deficiencies of vitamin A and iodine are minor in comparison, and yet have received more programmatic attention than iron or protein deficiencies. (This disproportionate attention may be due to the low cost of vitamin A and iodine fortification, along with the possible success of these fortification programs.)

Table 4-1: Estimated Economic Cost of DALYs Associated with Nutritional Deficiencies

Cause	DALYs ('000)*			Estimated Economic Cost of DALYs lost (in PKR billions)*	Percent
	Males	Females	Total		
1. Protein-energy malnutrition	230.0	261.4	491.4	91.1	18%
2. Iodine deficiency	28.3	53.7	81.9	15.2	3%
3. Vitamin A deficiency	5.6	5.5	11.2	2.1	0%
4. Iron-deficiency anemia	916.2	1,154.8	2,071.0	384.0	75%
5. Other nutritional deficiencies	44.1	59.7	103.8	19.2	4%
All nutritional deficiencies (Total DALYs)	1,224.1	1,535.1	2,759.2	511.5	100%
All nutritional deficiencies (Percent)	44%	56%	100%		

*Source: WHO GHE Database 2016 (http://www.who.int/healthinfo/global_burden_disease/en/). One DALY represents the loss of one year of full health.
**Cost estimated using GDP per laborer estimated to be PKR 308,994 in 2015. GDP per capita in 2015 was PKR 145,524. Total labor force as a percentage of total population was 35% in 2014, and we assume labor's share in GDP to be 75%. Source: World Development Indicators, 2015.

An alternative assessment of the economic costs of malnutrition is provided by WFP, employing direct estimation of losses from higher infant mortality, reduced productivity (due to anemia in adults and

stunting, anemia, and intellectual disabilities in children), and health costs due to higher rates of illnesses (Table 4.2). This alternative method yields a higher cost of malnutrition from a loss of earnings/GDP than the DALY approach, at PKR 704.3 billion. This is based on an estimate that a total of 177,880 children die due to undernutrition and that productivity losses occur due to anemia, stunting, and developmental disabilities due to undernutrition. In this approach, 33.5% of the total cost of malnutrition can be attributed to infant mortality caused by inadequate nutrition, and a further 55.1% of the cost results from productivity deficiencies among surviving undernourished children.

Table 4-2: WFP Estimates of Economic Costs of Undernutrition

	Billion PKRs	Percent
Loss of earnings	691.8	98.2%
Cost of child mortality	236.0	33.5%
Productivity loss due to anemia in adults	68.0	9.7%
Productivity loss due to anemia, IDD and stunting in children	387.8	55.1%
Health costs	0.7	0.1%
Education costs	11.8*	1.7%
Total economic cost of undernutrition	704.3	100%

Source: WFP, 2017.
* Saeed et al., 2017.

Cost of Eliminating Undernutrition: In Chapter 2 (Section 2.2.3), we estimated the financing required to achieve significant progress towards nutrition targets related to stunting, wasting, exclusive breast-feeding and anemia. We found that a complete package of 13 nutrition specific interventions that address these areas, when implemented in 2017 and 100% coverage is achieved by 2021 and maintained to 2025, would cost a total of PKR 193 billion over the entire period, or an average of PKR 16 billion per annum. Hence, the cost of nutrition interventions is extremely low in comparison to cost of doing nothing presented above. The estimation of financing needs was done using a framework provided by the World Bank (Shekar et. al., 2017), which projects that the full-package of nutrition-specific interventions would reduce stunting by 20%, and the returns per dollar-spent yield economic benefits between USD 2 and USD 37 in South Asia, taking into account lives saved and earnings gained. (The highest return of USD 37 is to breast-feeding interventions. The lowest return is to SAM interventions as these are expensive but the return is above 1 even in this case.) Thus, even though nutrition-specific interventions alone are not sufficient to eliminate all nutrition (and hence all losses estimated above), the cost of the interventions is well below the cost of failing to act, and hence safely worthwhile.

4.1.1.3 Data and Analyses Gaps

Frequent and reliable data are key inputs for evidence-based policy-making needed to achieve food security and adequate nutrition. Given their varied dimensions, the assessment of food security and nutrition requires data on food availability, on economic, physical, and social food accessibility, on food utilization, and on multiple long-term aspects of resilience and stability, ideally collected representatively at the smallest possible units of government administration. For Pakistan, despite a

plethora of surveys, there are many limitations in terms of data collection frequency, consistency and coverage, and questionnaire design (Ejaz, Davies and Tariq, 2017).

One of the main goals during the Strategic Review was to identify, with some precision, the types of food-insecure populations and then to look at different programs of support. Due to data limitations, we were only able to do this analysis in a rough way. The central issue is that the HIES has limits in being able to identify the true extent of food insecurity because it measures food consumption at the household level and not by individuals. It is possible to analyze the proportion of households that are food-insecure on average, but it is harder to identify by how much they are insecure, which is essential to targeting. The NNS and MICS do better in this regard for (very important) subpopulations, but they also do not help identify the broader incidence of food security. Therefore, it must be assumed that all members of the household are equally disadvantaged, and it is difficult to say by how much, since that will vary by individual. Some observers also feel that large surveys are inadequate for nutritional surveillance purposes, so the system of surveys needs to be thought through.

Pakistan relies on large-scale household surveys for data on the nutrition status of the population. Most of these surveys are not done on a fixed schedule and adopt different methodologies and sample sizes (amendments have recently been made for MICS and PDHS in this regard), while neglecting certain segments of the population, such as adolescents and the elderly, making comparisons and assessments of progress difficult. Individual-level food consumption information is needed to capture intra-household disparities and data on nutrition and health of populations other than mothers and children. Therefore, a population-level nutrition surveillance system is needed to assess the level of malnutrition and inclusion of programming-relevant nutrition indicators under the District Health Information Systems (DHIS). In addition, the nutrition surveillance system needs to be embedded in the existing health surveillance system in addition to an overarching food security monitoring system, which integrates agricultural production, market information systems, and monitoring of vulnerable groups to provide a holistic picture with regard to their nutritional assessments and associated health indicators. (The Food Security and Terms of Trade indices proposed by the Food Security Task force of 2009 are good examples of ongoing data series that are needed. Many of the needed data series will be developed for the SDG targets as well). Integrated surveillance systems and data collection will permit trend analyses and early warning of food insecurity and nutrition emergencies.

4.1.1.4 Fiscal Space Gaps

Davies et al. (2017) explain that after devolution, many projects related to the social sector are now implemented by provinces, while the federal government largely allocates budgets for infrastructure. The large contribution seen in social security, welfare and safety nets, exclusive of health and education, is mainly through BISP and food subsidies, while expenditures on roads, education, health, agriculture, law and order also increased after devolution. In contrast public expenditures on health and education were similar to pre-devolution trends and were stagnant for two decades at about 0.50% of GDP for health and 2% for education.

Many of the nutrition-specific programs implemented to date have been development partners' initiatives that last several years, and at times, are quite substantial and longer running. With the Multisector nutrition strategies in place, being evidence based and using best practices, the Multi-donor trust fund that supports major nutrition programs is likely to provide an important base for nutrition programming. However, given the lack of progress in nutrition indicators, more funds and focused programs are needed from government support.

Government spending on agriculture and food security is substantial, particularly in recent years due to transitional schemes involving large one-off outlays. However, this spending tends to be highest on short-lived and nonproductive subsidies, taking much available fiscal space and averting government focus from increasing agricultural productivity or enhancing nutrition (Davies et al., 2017). Even a small fraction of these sums, if reallocated, could fund nutrition and food security programs, with long-term benefits that are large and more permanent than the transitional schemes and nonproductive subsidies, which are described below.

In Punjab, examples of one-off outlays that are fairly large include PKR 150 billion was spent by the Government of Punjab on rural roads (over three years), and a further PKR 100 billion is planned to be spent on irrigation and agriculture (over two years). Agriculture-related subsidies declined substantially from PKR 45 billion in 2010-11 to PKR 16.59 billion in 2013-14, although they rose to PKR 31.60 billion in 2016-17. Actual spending on subsidies in Punjab increased each year after devolution, from PKR 476 million in 2009-10 to PKR 16.94 billion in 2014-15. Mostly, agriculture subsidies were allocated to short-term packages and schemes for the general public, such as *Sasti Roti*, other food support programs, a Ramazan package, and a green tractor scheme. Sindh also approved a subsidy scheme for tube wells[12] in 2016 and spent funds on food subsidies. KP and Balochistan also spent funds on food subsidies and tube well subsidies. In total, these federal and provincial subsidies, were in the range of PKR 56 billion in 2015-16, excluding allocations to the Pakistan Agricultural Storage and Services Corporation.

The government has also been subsidizing the manufacture of fertilizer (urea) by providing low-cost gas to manufacturers at about PKR 40 billion (Ali et al., 2016). Finally, the irrigation system in Pakistan consists of a large system of dams, barrages and canals that are maintained by the government with negligible levels of cost recovery from farmers through *abiana*. Thus, in effect, irrigation waters are almost entirely subsidized by the government. The cost to the government to pay for operations and maintenance is in the range of PKR 166 billion per year (Davies, 2012; Davies et al., 2017). Together, these costs summed to about PKR 393 billion per year in recent years, much of which goes to larger farmers.

4.1.1.5 Accessibility Gaps

This section reviews multiple dimensions of food accessibility, including affordability, social protection, physical remoteness, WASH, marketing and distribution, and food safety and quality.

[12] In 2016, Sindh approved the Provision of Solar Water Pumps/Tube Wells on Subsidized Rates to Farmers in Sindh at a cost of PKR 1,000 million total (Government of Sindh share PKR 802 million, farmers share PKR 198 million).

Low Affordability. Two out of every three households are unable to afford a minimum staple-adjusted nutritious diet within their current food expenditures, with clear implications for malnutrition and micronutrient deficiencies (GoP and WFP, 2016a). Additionally, the cost of a staple-adjusted nutritious diet is higher in urban areas than in rural areas. Given the fact that Pakistan has the highest rates of urbanization in the region, the higher cost of nutrition in urban settings poses a serious concern to the already difficult food security situation. Moreover, a rising urban population would have higher a demand for diverse foods, which could further push up food prices (Kedir, Schmidt and Waqas, 2016). Since the lack of food diversity and the prevalence of high micronutrient deficiencies are both present across all wealth quintiles, nutritional knowledge and education are needed in addition to efforts to close the affordability gap for the 67% of households with expenditures below the nutritious diet threshold.

Shortfalls in Social Protection. To ensure better nutrition in the short- to medium-term, social protection is required, so this section outlines gaps in the current levels of social protection, and looks at the most vulnerable segments of the population who are largely unreached by current programs. A detailed discussion on the availability and amount of social protection in Pakistan has been covered in Chapter 3. Adding up major programs, such as the BISP, efforts by the Pakistan Poverty Alleviation Fund and the *Bait-ul-Mal*, and direct and indirect agricultural subsidies, reveals that PKR 528.3 billion was spent in 2016-17 alone on social protection. Despite all efforts, however, the Multidimensional Poverty Index indicates that 38.8% of the population (2014-15) are poor, with deprivations in education, health and/or living standards. Additionally, 29.5% of the population falls below the monetary poverty line needed to meet the costs of basic needs (2013-14). On the food security front, more than 40 million Pakistanis remain undernourished[13], with even larger numbers suffering from various micronutrient deficiencies.

The high levels of poverty and food insecurity might mean that social protection systems thus far have not been as comprehensive as possible, mainly due to low coverage, a lack of monitoring and supervision, and inadequate systems, with likely duplication in efforts (Syeda, 2015; Jamal, 2010). The cash transfer (PKR 1,566 per month) from BISP, which is the biggest social protection program, is generally not enough to take families out of poverty. In addition, BISP only covers approximately 34% of people at risk[14], with nearly two-thirds of the at-risk population not covered by the program.

Specific segments of the population are under-covered or unreached. An analysis of the food consumption patterns of different population cohorts reveals that the urban poor and rural landless often fail to meet minimum daily dietary requirements. The characteristics of these two population groups are assessed below.

The Urban Poor: The urban poor face unique challenges compared to their rural counterparts, since they are almost exclusively dependent on markets for food and other basic items, and therefore more

[13] Number persons consuming less than 1,786 kcals per day per adult equivalent.
[14] Defined as individuals consuming less than 2,150 kcal per day for this analysis, which is the recommended daily allowance for energy consumption from the MoPDR Food Composition Table 2001.

susceptible to price shocks. This market dependency, coupled with higher urban unemployment rates, creates a constant threat to food security. Studies from other developing countries find that the urban poor are more engaged in the informal sector, with poor women more likely to have insecure or irregular jobs. In the absence of traditional family networks found in rural areas, urban poor must engage in riskier coping mechanisms to manage shocks, including high levels of debt (Mohiddin, Phelps and Walters, 2012).

The overall headcount of rural poverty is higher than that for urban poverty, but the urban population is relatively more nutritionally insecure. Based on preliminary results of a study currently being carried out by the GoP (MoPDR) and WFP, the average caloric, protein, and micronutrient intake is lower in urban areas than in rural areas across Pakistan. Consequently, the poor (in the bottom two expenditure quintiles) in urban areas consume 1,782 kcal daily, only slightly above the undernourishment level and less than that consumed by the rural poor. With regard to nutritional outcomes, not only are the rates for stunting and wasting highest for the poorest children in urban Pakistan (GoP & WFP, 2016b), these children are also 2.5 times more likely to die under the age of five than urban rich children.[15]

Rural Landless: About 60% of the population in Pakistan resides in rural areas (GoP, 2016a), where one out of three Pakistanis is unable to meet the costs of basic needs, and one out two is deprived of access to education, health services, or improved standards of living.[16] Persistently high levels of poverty in rural areas most severely affect the landless; various studies have found poverty in Pakistan to be highly correlated with landlessness and have estimated their poverty at 54% (Anwar and Qureshi, 2002). In Pakistan, land distribution is more skewed than income distribution, as about 63% of rural households are landless, while only 2% of the rural households own 50 acres or more, accounting for 30% of total land (Hirashima, Salam and Ahmed, 2009; Kaniaru, 2007). Breakdown of the MPI further reveals that, except for rural Punjab, the indicator for access to land and livestock has significantly decreased from 2004-05 to 2014-15. Moreover, only the top 40% of landless rural families consume the daily required caloric intake.

With limited (and decreasing) access to land and other assets, the rural landless are small livestock herders or daily agricultural and other wage workers. Income from these activities is unstable and highly susceptible to seasonal variability. The nature of this employment makes the rural landless highly vulnerable to negative economic shocks, and they have limited capacity to deal with such shocks. Data from the PRHPS) (2017) reveal that the rural landless usually have little or no savings, a limited asset base, and little access to insurance, credit or other assistance-based strategies. Rather, they rely on family, friends, and the local community. However, in the case of covariate shocks, affecting multiple households, these resources also fail. Thus, entire landless communities can fall into poverty or deeper into poverty.

[15] https://www.thenews.com.pk/print/39016-pakistans-urban-poor-children-2.5-times-more-likely-to-die-than-their-richest-counterparts

[16] Cost of Basic Needs Poverty Headcount and Multidimensional Poverty Headcount estimates, as reported in the Economic Survey of Pakistan, 2015-16

Physical Remoteness. As already discussed in Chapter 3, there are limitations of physical accessibility to food in some remote areas in Pakistan, especially in the northern parts of KP, AJK and GB. These areas have rural economies, mostly with small or no land holdings, and limited economic opportunities, and they rely heavily on internal migration of male members of households for employment. A majority of the households in such areas have limited purchasing power and, therefore, there is limited consumer demand. Larger markets fail to flourish, as higher transportation costs are an additional deterrent.

Poor WASH Facilities. Issues of WASH are major causes of poor nutritional outcomes since they contribute significantly to the incidence of diarrhea and various water-borne illnesses. Though Pakistan made significant progress on the MDGs related to sanitation, major gaps pertaining to a lack of basic sanitation and toilet facilities, the practice of open defecation, and provision and proper treatment of drinking water still remain.

Weak Marketing and Distribution Systems. Many challenges in raising food availability and accessibility can be attributed to poor marketing and distribution. Issues include poor post-harvest management; lack of modern wholesale markets; inadequate roads from farm to market; insufficient storage facilities; a lack of modern cold chain infrastructure; unskilled processing and value addition; poor physical handling of perishable products; inappropriate packaging; and non-implementation of grades and standards (GoP, 2009).

A related issue is in the system of wheat procurement and distribution, which has been managed by provincial food departments for many years. They typically purchase wheat from farmers at a guaranteed price and release it to flour mills at subsidized rates. They store wheat regionally and deliver it to flour millers over the year, after which it goes into the general wholesaling and retailing distribution system. Generally, the government purchases one-third of the wheat produced, which exerts pressure on government storage facilities and indirectly on private sector capacity. Pakistan loses PKR 6 to 7 billion per year because of the lack of adequate wheat storage, and at least some of this loss is related the current bag system used to manage the procurement system in Pakistan (Davies et al., 2017). One positive note is that these departments have experience in large and complex distribution programs.

Recent legislation for the establishment of food authorities moved the food departments closer to regulating food fortification. Punjab established its authority in 2011, Balochistan enacted such a bill in 2014, and the Sindh Assembly passed a similar bill in March 2017. Furthermore, the National Fortification Alliance was established in 2013 under the Ministry of National Health Services, Regulation and Coordination, which also oversees the expansion of fortification programs that were suspended due to devolution. However, only donor-related fortification efforts have been funded, and only Punjab has mandated wheat flour fortification.

According to NNS 2011, iodized salt is often mentioned as a success story of fortification programs, with 70% coverage. However, further increases in the coverage to remote areas are needed. Salt processors are already facing meager profit margins since the discontinuation of a subsidy on potassium iodate. The situation is worsened by low demand for iodized salt. Stakeholders in regional consultations highlighted as challenges the lapse in quality assurance by processors and non-existent monitoring for standards

from provincial food departments. Specifically in Balochistan, there is patchy availability of iodized salt in remote districts. Thus, improvements in distribution, labeling and regulatory enforcement is still necessary in markets even where there has been some success.

A further issue is that farmers traditionally grow a set of cereal crops that has not changed much in recent years. Pakistan's agriculture is fixated on four major crops (wheat, rice, cotton and sugarcane), and recently maize, which account for 78% of total cultivated area. Wheat dominates the acreage, as it is grown on nearly 42% of total cropped area. Nearly 83% of total cultivated acreage in Sindh is under five crops, followed by KP (80%), Punjab (75%) and Balochistan (61%) (GoP, 2010). There are a number of possible reasons for these outcomes, including risk aversion, policies and industrial structure, and a lack of adequate value chains to give price signals and supportive contracts, grades and standards to broaden the commodity production.

Food Safety and Quality. The issues described above are further compounded by a lack of food safety standards and implementation. This leads to health issues, including food-borne illnesses, and ultimately poorer nutrition. The absence of systemic surveillance of food quality and food-borne illnesses poses a first obstacle, making it difficult to assess the scale of problems related to food safety. The excessive use of pesticides results in residues and heavy metals in food and water; improper food storage causes aflatoxins in milk, cereals and beans; and bacteria and other microorganisms in food prepared at home and by food vendors commonly cause diarrhea, dysentery and various other gastrointestinal diseases (Akhtar, 2015; Younus et. al., 2013; Hussain et. al., 2010). Furthermore, there is evidence of over-use of antibiotics in livestock, causing pathogens in meat to be antibiotic resistant (Ali et. al., 2010). Water resources are contaminated with sewage and industrial waste, which contaminates food supplies from peri-urban farms. These problems pose direct risks to public health and nutrition.

4.1.1.6 Gender Gaps

Women's empowerment and gender equality are important indicators of the level of food and nutrition security in a household. Equity gaps can be attributed to societal norms, limited resources available to women to engage in productive activities, and a lack of policies aimed at empowerment of women.

Ahmad et al. (2016) use the PRHPS (2017) to show that 83% of women in rural Pakistan are disempowered, as they lack ownership or control over assets and use of income earned. Women also are disempowered based on indicators for inputs into production decision-making (68%)[17] and autonomy in production (64%). Half of women in rural areas are disempowered based on indicators measuring autonomy over household decision-making and mobility. These indicators also show that younger women are more disempowered than older ones, partly due to greater restrictions on decision-making power and mobility. Generally, women who have a son are more empowered and report greater ownership and control over resources than other women. Women living in joint families are also less

[17] Ahmad et al. (2016) define inputs into production decisions as the following: (1) food crops to be grown for household consumption, (2) cash crops to be grown for sale in the market, (3) livestock to be raised, (4) nonfarm activities to be undertaken, (5) inputs to buy for agriculture production, and (6) taking crops to the market.

empowered as they have less potential to provide input into production decision-making, control over purchase and sale of assets, decisions regarding expenditures, and decision-making in the house.

In the gender parity domain, Ahmad et al. (2016) show that there are huge differences in the levels of empowerment between women and men in rural areas of Pakistan, where they find that 19% of women overall are empowered compared to 91% of men. If incomes earned by women are an indicator of empowerment, then Pakistan lags behind in this area as well. Zaidi and Farooq (2016) use the Labor Force Survey (2013-14) to show that the earnings ratio of women to men as crop farm laborers is only 56% and that of livestock farm laborers is 76%. Based on the number of hours worked, the economic contribution of unpaid family workers in agriculture is almost the same for men and women (PKR 417 billion for men compared to PKR 391 billion for women). Their calculations show that the cumulative losses due to the wage gap totals PKR 500.5 billion, mainly in rural areas. They describe the cumulative wage gap as income losses incurred by a woman over her working life, for women between the ages of 25 and 60, working 35 hours or more per week.

A long-standing culture of male-domination and the marginalization of women in decision-making (in households, communities and policy-making) were also noted in the provincial consultations as impediments to good household nutrition. These perceptions were consistent across the board. It was noted that the majority of dietary programs target women of reproductive age and girls, while decisions regarding food choices fall to the main decision-makers in the house, generally men or mothers-in-law, who are not educated in such matters. In FATA and KP, the group felt that low female literacy rates and a male-dominated culture contributed to a lack of awareness and an inequitable distribution of food among family members (with men given the best portions even without asking, and mothers-in-law determining what women eat during pregnancy). (The discussion on intra- household consumption patterns confirms this insight). FATA's unique political/community system, which is not gender-sensitive, presents a challenge and has not been utilized to bring nutrition to the policy agenda. Additionally, large family sizes overburden women, making it difficult for them to prioritize their health or the health of their children. Long distances to health facilities and suboptimal care from providers often discourage women and families from seeking care, especially for preventative nutrition services.

4.1.2 Gaps Specific to Food Security

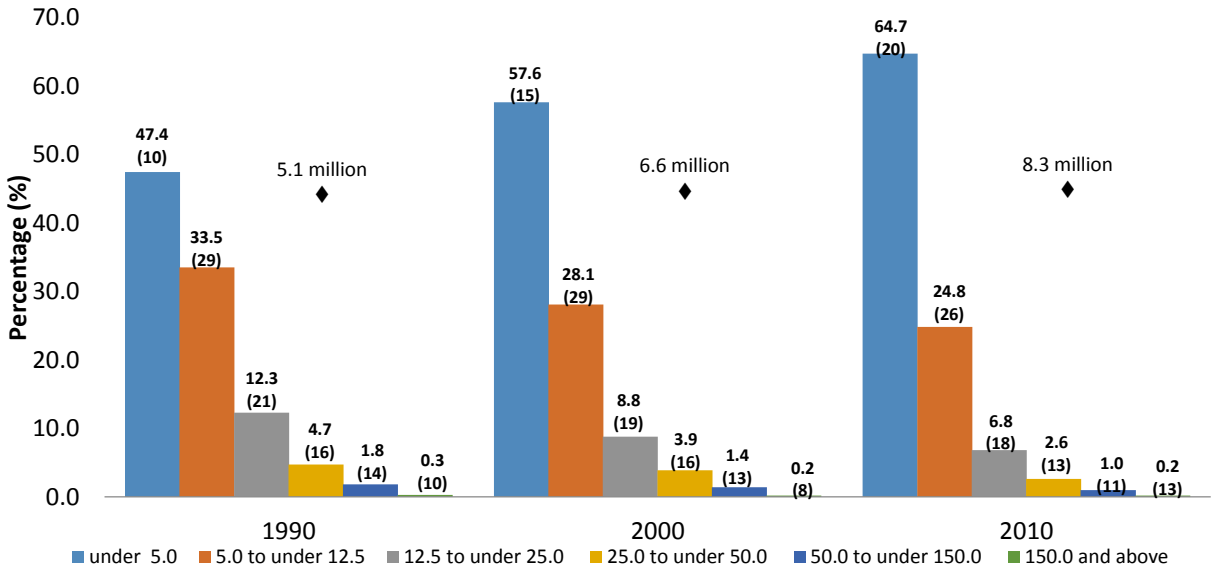
The underlying determinants in this section fall under availability and sustainability of food. Accessibility is discussed in section 4.1.1.5 since it relates to both food security and nutrition.

4.1.2.1 Availability Gaps

In Chapter 3, the situation analysis showed clearly that population pressure on each acre of land grew by 85% and is expected to increase by another 28% by 2030. The Strategic Review identified the following gaps related to food availability falling behind population growth. These gaps include the changing structure of farms, agricultural productivity growth driven by increases in input use rather than technical change, the need for higher cropping intensity, the need for greater investment in R&D, and climate change impact on productivity. All of these gaps contribute to low crop productivity, food diversity, and affordability and therefore affect Pakistan's food security.

Income Sources and the Changing Structure of Farms. The increasing number of small farms at the lower end of the distribution, with less than five acres, makes agricultural productivity growth more challenging. As Figure 4.1 shows, this category of farms has increased from 47% of all farms in 1990 to over 65% in 2010, and the land operated by these farms has doubled from 10% in 1990 to 20% in 2010. While the smaller farms come largely from land inheritance traditions, land fragmentation, with separated smaller plots on many farms, makes the growth of small farms more problematic, and leads to a greater likelihood of poverty in the farming population. This shift in acreage came mostly out of mid-sized (12.5 to 50 acres) farms, whose acreage dropped from 37% to 31% of total acreage. (Mid-sized farms are often owned by small commercial farmers (SCF), whom we feel should be encouraged.) The largest farms, over 50 acres, stayed at 24% of total acreage. These dynamics make the challenges in agriculture more complex.

Figure 4-1: Declining Farm Size, 1990 - 2010



Source: Agriculture Census (various issues)
Note: Numbers in parentheses show percentage of total acreage.

Moreover, land inequality is still a crucial limiting factor for inclusive agriculture growth in Pakistan due to asymmetrical distribution and concentration of land at the upper size of farms. Qureshi et al. (2004) show that the Gini coefficient[18] of land inequality was 0.75 in 2000 for Pakistan, and similar results (0.68) were found by Rashid and Sheikh (2015), much closer to a perfect inequality value of 1 and much more concentrated than is income, which was estimated by UNDP as 0.3[19]. Since tenants and sharecroppers have little incentive to invest in sustainable agricultural production, the insecure land tenure system, along with poor land and water management and planning, lead to increased degradation of the land.

[18] A statistical measure of the degree of variation represented in a set of values, used especially in analyzing income inequality, where perfect inequality is a 1 and perfect equality is 0.
[19] http://hdr.undp.org/en/content/income-gini-coefficient

The proportion of income sources from farming changes very clearly with the distribution of farm size, as shown in Table 4.3. The dependence on crop income as a source of total income rises from zero for nonfarm families (logically) to 80% and above for the largest farms. Somewhat surprisingly, the reverse pattern is seen in livestock income, where farms from 3 to 5 acres obtain over 22% of their income from that source. On balance, however, crop income accounts for three times the level of livestock income. Wages and salaries are one-third of total income for all families, but the smallest farms and nonfarm families account for most of this dependence. Over 10% of family income comes from remittances.

Mellor and Malik (2017) examined the smallest farms, with less than 3 acres of land and an average holding of 1.4 acres, and found that potential production barely meets the calories needed for a family of six. On the other hand, the SCFs, with 3 to 75 acres, have enough land to produce output sufficient to exceed the poverty level, but consume products and services that are locally produced and create income within the rural economy. In contrast, the largest farmers buy more imports and services from overseas and from urban areas, which lead to fewer poverty reducing income gains. The SCF thus has higher output multipliers from agricultural income, as well as employment. Given the high transaction costs of delivering subsidies to the smallest farmers with less than 3 acres, and given their relatively small amount of income from farming, governments need to consider revamping subsidies to target SCFs with agricultural programs and use social protection schemes for smaller farm size categories.

Table 4-3: Percentage Share of Each Source of Income in Total Income by Size of Farm

Size of Farm (acres)	Crop Income	Livestock Income	Wages and salaries	Business Income	Rental and Pension Income	Other Transfer Income	Remittances	Total Income
Nonfarm	0.0	3.4	56.4	19.3	3.8	2.2	14.9	100
More than zero but less than 3	27.3	19.8	23.6	13.3	2.7	1.6	11.9	100
3 to less than 5	51.4	22.2	13.0	4.7	1.2	0.8	6.7	100
5 to under 12.5	65.2	16.8	8.1	4.0	0.9	0.8	4.1	100
12.5 to under 25	73.2	16.1	5.4	2.0	0.6	0.7	2.1	100
25 to under 50	70.3	17.2	4.4	2.7	0.6	0.2	4.5	100
50 to under 75	85.0	9.9	0.9	1.8	2.1	0.1	0.2	100
75 and above	80.3	7.7	5.3	5.4	0.5	0.0	0.7	100
Total	28.5	10.8	33.7	12.6	2.6	1.5	10.4	100

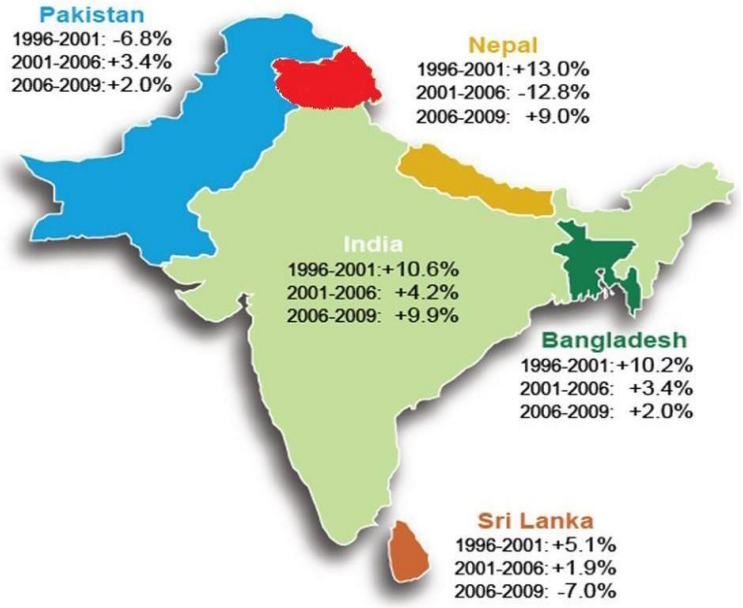
Source: HIES, 2010-11 (www.pbs.gov.pk/content/household-integrated-economic-survey-hies-2010-11)

Intensive Input Use. Recent agricultural growth in Pakistan has been largely driven by increases in input use rather than technical change (Ali and Byerlee, 2002; Kiani, 2008; Touseef and Riaz, 2013). The absence of sustained total factor productivity growth and the trend toward input intensification may be closely linked to resource degradation (Ali and Byerlee, 2002). However, further use of inputs cannot easily increase production or yields. Cultivation of improved seed is growing at the rate of about 7% annually, but at present it is costly, often unavailable, and of inconsistent quality. Deployment of tube wells has been growing at 5.1% annually, tractors at 3.8%, and consumption of fertilizer at 2.7%, but the productivity of urea use is declining in wheat and cotton (Ali et al., 2016; and GoP, 2014b). Few of these inputs can significantly add to the growth needed. For example, since tractors are used on the majority

of farms, research has shown that fertilizer is being used to nearly its optimum level (at least for urea), and further tube well development is limited by declining water tables.

The cropping intensity in Pakistan is 148%, which indicates that higher productivity per unit of arable land can come from moving to more seasons per year. Cropping intensity is lowest in Balochistan, at 100%, and highest in Punjab, at 155%, or slightly above one and a half crops per year. In KP, cropping intensity is 147%, followed by Sindh at 135% in 2014-15 (GoP, 2014b). More inputs will be needed as cropping intensity rises, and new products can raise an input's productivity, adding to cropping intensity.

Figure 4-2: Agricultural R&D Trends in South Asia, 1996–2009



Source: ASTI, 2012.

Inadequate R&D. The growth in R&D in Pakistan has been lower than in India or Bangladesh in the 2000s, which hurts the farm sector over the longer run (Figure 4.2). The private sector added only 6% of the total country's spending on agricultural R&D, and compared with the Asia-Pacific region, the qualifications of research staff are relatively low. Moreover, only a small proportion of female researchers exist compared to other Asia-Pacific regions (ASTI, 2012a). An Independent Third Party Evaluation (ITPE) of the Pakistan Agricultural research Council (PARC) was carried out in 2012 by IFPRI, which highlighted challenges in the national agriculture research system as well as the situation after devolution. The ITPE identified PARC's limited focus on strategic development in coordination with provinces, a lack of incorporation of stakeholder demands into research planning and priority setting, human resource capacity and management. It was also identified that financial support and management, especially at the Federal level, is deficient, and weak M&E of research programs and projects existed (IFPRI, 2013). To truly overcome these limitations in the current research system, one

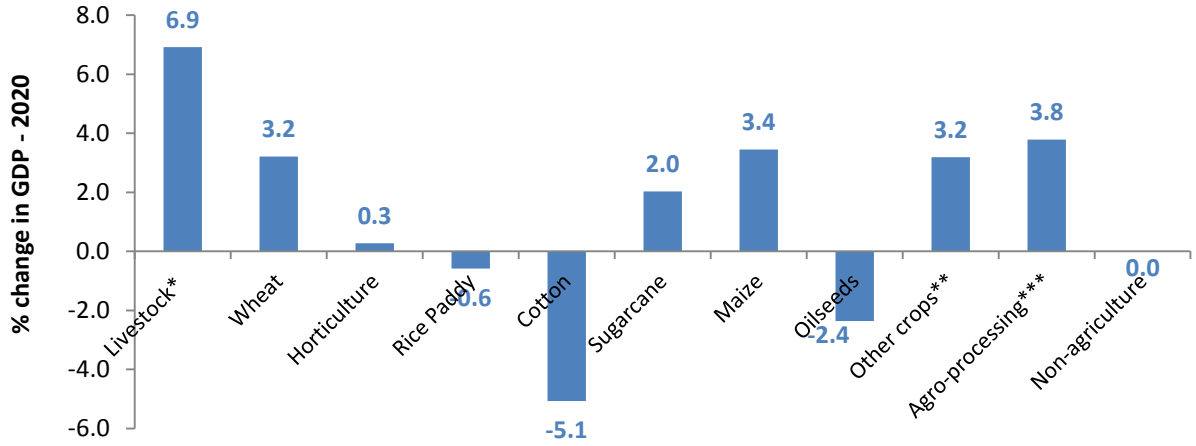
area that is promising to link public researchers and the private sector, with other stakeholders is to create agricultural research boards. At the provincial level, presently, they are only operational in Punjab as an autonomous body, while legislation has been passed in Balochistan for their development. In Punjab, the board is constrained by a weak institutional setup, human resource and financial constraints, but the commitment to increase its effectiveness exists.

Impact of Climate Change on Productivity. Pakistan has been experiencing adverse climate conditions, which pose a high economic cost to property, infrastructure, and buildings, as well as to agricultural productivity (Husain, 2015). A large literature in Pakistan has highlighted the consequences of climate change on agricultural productivity and food security in the country. Studies show that a 1^0 C rise in atmospheric temperature would decrease wheat yield by 5% to 7% (Aggarwal and Sivakumar, 2011) while other studies predict a higher decline of 6% to 9% in wheat production across Pakistan (Sultana and Ali, 2006). Ahmad, Siftain and Iqbal (2014) found a similar relationship, namely that a rise of 1^0C in mean temperature during the sowing period reduces wheat yield by 7.4%, while it would have a positive impact on wheat yield if the same temperature rise occurred in the months of January and February. Mean precipitation during sowing and maturity periods would impact wheat yield positively.

Underdeveloped Livestock Sector. The livestock subsector plays a pivotal role in overall agriculture growth and rural development. About 8 million families generate 35% of their income from livestock, showing its evident importance. Interestingly, the country has become the 11^{th} largest poultry producer in the world, employing 1.5 million laborers (GoP, 2016b). Rapid urbanization and improving per capita income increase demand for livestock products.

We find that increasing productivity in livestock (and associated sectors) would also create shifts in cropping patterns in favor of wheat, maize, and other crops due to their use as fodder, and away from cotton and to a lesser extent rice. This is seen in Figure 4.3, which shows results from an economy-wide simulation model. We first simulate a base scenario where all sectors' productivity grows by 2% each year (from 2014–20). We then accelerate livestock's productivity growth to 3% per year. This results in an addition of 6.9% to livestock's own GDP in 2020 (over the base scenario), but also a 3.2% increase in wheat, and similar increases in maize and other crops. Cotton's GDP declines by 5.1%, while rice decreases by 0.6%. (Oilseeds also decline, though this is a small sector). Thus, gains in wheat, maize, and other crops come from the demand for livestock feed, which forces out cotton production. Taken together, while encouraging greater dairy and meat consumption, there is also a tendency to keep cereals consumption higher than desirable.

Figure 4-3: Simulated Change in Sectoral GDP by 2020 Due to Acceleration in Livestock Productivity

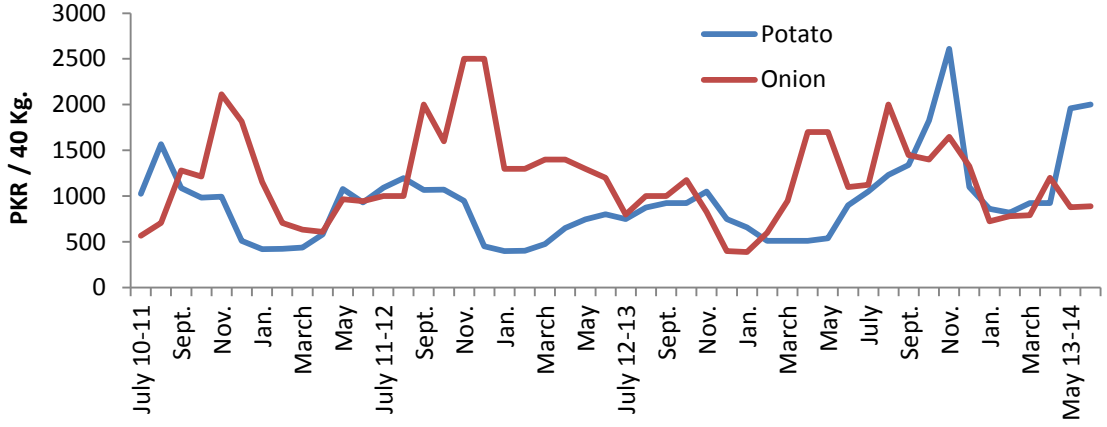


Source: Authors' estimates using computable general equilibrium (CGE) simulations
* Includes meat (slaughtering) and dairy sectors.
** Includes fodder crops, *bajra, jowar*, pulses, tobacco, etc.
*** Milling, vegetables oils, sugar-refining, other food processing, and cotton ginning.

One challenge is how to keep the small livestock operator in business while raising productivity. Livestock is a critical strategy for income and asset accumulation among landless rural households and it acts as a safety net against crop failures, floods, and other shocks. While quite a number of programs exist to help poor families access livestock assets for income and social protection, these have remained small. There has been no concerted effort to determine the ultimate potential of this approach. Rangelands are overgrazed, with little focus on management, and only provide about 10-15% of potential fodder, so one issue for many who depend on small ruminants is adequate rangeland (Dost, 2006).

Seasonality in Agricultural Output. Pakistan has a range of cropping seasons throughout the year, as Sindh and the northern areas of KP face different climatic conditions at the same time, which enables cultivation of a variety of crops to fulfill market demands in separate seasons for different food commodities. This wide range of climatic conditions facilitates cultivation of some crops twice a year. Seasonality in agriculture has a huge impact on food availability and prices, with prices lowest at harvest and highest in the off-season. Food availability and price stability can therefore be increased by storing food crops at peak seasons. Furthermore, building storage facilities and improving the distribution system of agriculture commodities make it possible to supply nutritious food to a wider population at affordable costs. Also, development of major crop varieties resistant to high temperature and drought could reduce the impact of climate changes on crops.

Figure 4-4: Monthly Wholesale Prices of Potato and Onion, 2010–14



Source: Agriculture Statistics of Pakistan, 2013-14.

Figure 4.4 shows the monthly prices of potatoes and onions from July 2010 until May 2014. The price of onions is highest in October and November, but starts decreasing after harvest as the bulk of both commodities are available. Prices are lowest during the harvest period and increase thereafter over time. The price variation depends on the year, so that the price of onions hit PKR 2,500 (per 40 kg.) in November of 2011 but was only PKR 2,000 in the previous year. The peak onion price can be almost five times the lowest price, and the ratio for potatoes is three times. The ability to store produce more effectively would smooth these price variations considerably.

4.1.2.2 Sustainability Gaps

Sustainability in food security requires long-run stability in both the availability and accessibility of food. For availability, important factors along with increased agricultural production and income include the nutritional quality of commodities, and issues in climate change. For accessibility, stability can be defined as the resilience capacity of households to cope with shocks that affect their food security. The resilience capacity of a household is determined by the physical, human, and social capital that a household has and its access to basic services and safety nets.

Climate variability through an increase in temperature and changing precipitation distribution may have serious implications for livelihoods by affecting food supply systems, physical infrastructure, water resources, and employment opportunities (Befekadu and Berhanu, 2000; Deressa et al., 2008). The World Bank estimated that climate change could affect Pakistan's ability to sustain food sufficiency by 2080, even if the country adopts mitigation measures. Being a flood- and drought-prone area, Sindh may be unable to sustain food sufficiency beyond 2020. The most recent drought, in 2013-15, affected access to safe drinking water and thus reduced food production, and also made women less likely to breastfeed children (FAO, 2016). Impacts of climate change are likely to be felt more in rural areas of developing countries, like Pakistan, where most of the population relies on agriculture and natural resources for their livelihoods (Fischer, Shah and van Velthuizen, 2002; Stern, 2006; Cline, 2007).

At the household level, families suffer monetary losses due to these shocks. According to PRHPS (2017), the highest losses occur from economic shocks (57%), followed by natural/agriculture related calamities (25%). A large percentage of households (67%) dealt with shocks by changing behavior, such as reducing consumption, searching for cheaper food options, and changing occupations, while only 16% have utilized assistance-based strategies, and 23% of households did not use any strategy at all. Despite the establishment of national and subnational disaster management authorities, significant challenges to the functioning of these systems still remain. The weakness of these systems increases the time it takes for families to recover livelihoods and for the agriculture system to return to its original functioning.

4.1.3 Gaps Specific to Nutrition

4.1.3.1 Lack of Awareness

As mentioned in the situation analysis in Chapter 3, household dietary intake is dependent on numerous factors, and education and nutritional awareness play a vital role. The knowledge of the general population is extremely poor when it comes to understanding a minimal acceptable diet, appropriate feeding frequency and dietary diversity. The situation analysis noted that 35% of households in Pakistan have low dietary diversity, with around half of their energy intake coming from cereals (GoP, 2017). Other indicators were also outlined in the Food Accessibility discussion (Section 3.3.2), which showed low nutritional knowledge, especially in the rural population, and cultural beliefs and taboos thought to limit behavior change and hamper utilization of diverse foods even if available. Surprisingly, low dietary diversity prevails even in the wealthiest quintiles, pointing out the gap in knowledge and practice. Section 4.1.1.6 notes that household decision-making about nutrition is often governed by men, so educating them is equally important. Overall literacy levels are low for both genders across the country, but women are most affected, especially in rural areas, as only 25% are literate in rural Sindh (PSLM, 2014-15).

Stakeholders in regional consultations pointed out the absence of basic nutrition courses in school curricula as contributing to this general lack of awareness about nutritious and diverse foods. In addition, a major gap is that policy makers, who have leverage over nutrition policies and practices, are insufficiently aware of the scourge of malnutrition and its long term costs to the population and economy. The exceptionally poor situation of WASH, and low early and exclusive breast feeding, indirectly point to a general lack of awareness amongst the masses for these important nutrition-sensitive and nutrition-specific interventions.

4.1.3.2 Weak Behavior Change Communication

The low awareness of the benefits of exclusive breastfeeding and other nutritional knowledge is further exacerbated by weak and ineffective BCC. As discussed in Chapter 3, Pakistan has the lowest rates (38%) of exclusive breastfeeding in the region, and up to 50% of newborns are provided pre-lacteal feeds. There is massive promotion of follow-on formulas through electronic media, public health facilities, outreach workers and health care providers. It was strongly voiced in provincial consultations that such mass media campaigns counteract the already weak BCC strategies in place for exclusive breast feeding. A large survey conducted by Save the Children in 2012 across Pakistan revealed that most mothers were

advised to use formula milk, and medical doctors who provide maternal and newborn care services are heavily incentivized to promote formula milk. The survey further validates that many health care professionals were not aware of the international breast feeding code and its rules. The private sector is largely unregulated in this regard. Even though breast feeding legislation exists for most regions, its enforcement is nearly non-existent (Save the Children, 2013). In addition, promotion of junk and convenience foods through media has adverse effects on dietary practices.

The groups across provinces and regions emphasized that there is insufficient focus on BCC strategies for implementation of nutrition programs. Stakeholders stated that BCC strategies are not sufficiently culturally specific to create awareness effectively about nutrition among different segments of the population. The discussions also suggested that resources allocated by different line departments for nutrition BCC should be pooled and culturally-specific BCC strategies designed.

Since nutrition-sensitive interventions are rolled out through various public sector departments, there has to be some conformity among BCC strategies to impact nutrition positively. However, BCC strategies vary by nature, scope and content, with little inter-departmental discussions and planning. One reason for the ineffectiveness of these strategies, according to regional stakeholders, is underutilization of formative research during the design phase. Additionally, BCC strategies for nutrition are not implemented comprehensive through all important platforms, such as education, community mobilization, advocacy and mass media. M&E of existing BCC strategies against nutrition-relevant indicators are also needed, stakeholders said, to bring about positive changes in health and nutrition practices.

Process evaluation is necessary to assess the BCC's quality, the way it was run and whether the target group was reached. This can be followed by outcome evaluation which measures changes in behavior, environments, health knowledge, social participation, and lifestyle or risk factors. Last but not the least comes impact evaluation to assess whether the BCC program has been effective in the long term and whether its overall goal was met. Evaluations need to cater to the delay of impact (behavior change may not be immediate), decay of impact (changes not sustained and situation reverts) and adjustment for secular trends (change may occur in desired direction even in absence of BCC – this needs to be adjusted to see changes above the general trend that can be attributed to BCC. (USAID, 2010; United Republic of Tanzania, 2013-2018)

While mass media is suitable for BCC, the lack of exposure to media in rural areas and regions like GB and FATA presents a gap. For example, the PDHS 2013 revealed that 73% of women and 57.2% of men in GB had no access to radio, TV or newspapers, even once a week. BCC strategies for FATA need special attention because FATA stakeholders mentioned that people of one tribe do not necessarily avail themselves of health services and facilities in nearby tribes because of traditional feuds and rivalries.

4.1.3.3 Inadequate Development and Monitoring of Nutrition Programs

Nutrition Surveillance System Lacking. Ideal nutrition programs should have the coverage to reach the most disadvantaged populations and vulnerable groups (lactating and pregnant females and children under age of 5 years), and should be materially assisted by a robust surveillance system. A major gap in

effective nutrition programming in Pakistan is the inability of the current system to track and monitor the nutritional status of vulnerable groups effectively. Such information is needed to assess the level of malnutrition and the needed programming. The nutrition surveillance system also needs to be linked to an overarching food security monitoring system that integrates nutritional assessments, agricultural production, market information systems, associated health indicators and monitoring of vulnerable groups to provide a holistic picture.

The current nutrition tracking is part of the health surveillance system, which has patchy coverage since, at the community level, it functions through an inadequate number of LHWs, who cannot reach the most vulnerable populations. (See Section 4.1.3.4 below.) In addition, the current DHIS does not put sufficient emphasis on core nutrition indicators and surveillance, which was voiced in regional consultations as a main challenge for nutrition programming. A revamped nutrition surveillance system based on appropriate nutrition indicators as part of the DHIS, would permit trend analyses and identification of nutrition emergencies.

Nutrition-Specific Programs. Nutrition programs should have wide coverage to reach the most disadvantaged and vulnerable populations. Successful implementation of programs for stunting reduction from Brazil, Peru and India demonstrate that to achieve considerable reduction requires separate awareness and supplement interventions at different growth stages (WHO, 2014). In Pakistan, a range of creative, donor-supported programs are being implemented, but they have yet to be scaled up. Examples of these programs are given below.

- WFP and UNICEF provide information about the importance of nutritional diversity as part of their emergency and relief efforts. Apart from donor initiatives there have been no other programs from the government to address stunting in children until recently, when Punjab and Sindh approved stunting reduction programs. WFP, in collaboration with UNICEF and WHO, is supporting provincial governments to target population groups most vulnerable to under-nutrition in several districts.

- The Government of Punjab has started interventions in eleven districts of south Punjab under the "*Khadim-e-Punjab* Child Nutrition and Stunting Reduction Program." Under this umbrella, WFP and the Department of Health are running a supplementary feeding project entitled "Promoting Safe Motherhood" for pregnant women and lactating mothers. The project supplies vegetable oil in seven districts of Punjab (Bhakkar, Khuhasb, Mianwali, D.G.Khan, Layyah, Muzaffargarh and Rajanpur) through 152 WFP outlets. [20]

[20] Vegetable oil serves as a source of dietary calories and fat, including essential fatty acids, and aids in the absorption of fat-soluble vitamins. It contains no cholesterol and helps increase the caloric density of diets. It is given in the form of corn soy blend, which has a shelf life of 18 months at 80 degrees Fahrenheit and is meant to retain the micronutrient content for at least 12 months in the field.

- To promote IYCF, with the help of UNICEF, the Government of Punjab has trained 20 Master Trainers and 175 Health Care Providers in three target districts (Sheikhupura, Kasur and Nankana). Later, this IYCF Program will be expanded to other districts.

- The Punjab Livestock Department is distributing goats and poultry packages to vulnerable women to help enhance their nutrition, food security and income. The project also enables them to enhance their decision-making power.

- NI is rolling out iron folic acid (IFA) supplementation in 19 districts of 3 provinces. They plan to increase their outreach considerably by recruiting community resource persons from RSPs. Similar provincial government programs are needed.

- CMAM was initiated as "therapeutic strategy" to rectify acute malnutrition in children under five after the earthquakes in 2005 in AJK and KP. These efforts were extended after the floods of 2010 and 2011. Features of this program include supplying Ready to Use Therapeutic Foods (RUTF), micronutrient supplements, and referral to Out-patient Therapeutic Programs for severely wasted children, in addition to IYCF counseling. In remote districts, the availability of human resources to deliver the program was an issue, and referral rates were low. CMAM also is a cost-intensive initiative due to the import of RUTF and the need for specialized personnel and clinic use. (This also showed up as the program with the lowest net benefits in Chapter 2). Alternatives are low-cost, local production of RUTF, which exist as supplements like Wheat Soya Blend. Food for acutely malnourished pregnant and lactating women will also support prevention of low birth weight and SAM children.

While all of these donor-funded programs are potentially impactful, each project must be evaluated, and government resources should be invested in those that can contribute most quickly and effectively to improved nutrition and food security for vulnerable groups.

In regional consultations, stakeholders' lauded cash transfer programs such as BISP a great initiative for tackling poverty, but they were seen to lack nutrition-specific measures. Stakeholders felt that cash transfers increased access to food, but the nutritional impacts varied according to the governance of each program and the volatility of markets in each geographic area. In addition, these programs often lacked eligibility criteria and transparency in the identification of participants.

School Nutrition Programs. SFPs are a potential nutrition-sensitive intervention that can play a key supporting role in the achievement of nutritional outcomes as well as food security. SFPs are present in almost all countries of the world, and with increasing interest in using them to achieve nutrition targets (Bundy et al., 2009). A comprehensive review of existing literature and expert opinion by WFP and La-RAE (2017) finds that while major effects on height are not expected for school-age children, improving their nutrition and health can make a small contribution to linear growth potential and may prevent the continuation of stunting in older children. They report that nearly all SFPs that demonstrate significant height and weight gains included an animal-based product, which is not usually included in school meal programs in low-income countries. However, in lower-middle income countries, these programs could

be very appropriate for targeting micronutrient deficiencies and dietary diversity. Such programs are complex, implemented with varying designs/models responding to differing objectives, and thus have variable impacts (Drake et al., 2016). Therefore, it is critically important to create SFPs tailored to Pakistan with clear nutrition-sensitive objectives.

However, school nutrition programs have not been successful so far in Pakistan. Many such programs have been implemented over the years, mainly by donors, but all have failed to yield desirable nutrition outcomes. Many stakeholders felt that these programs have been poorly implemented, as they primarily targeted increased school enrolment rather than nutritional outcomes. Bangladesh provides a contextually similar but successful case study in which an SFP was implemented in chronically food-insecure areas. It provided fortified biscuits (containing 75% of recommended daily requirements of vitamins and minerals) that raised children's caloric intake by 11-19% (varying by urban/rural setting) and BMI by an average 0.62 points. The program also raised school enrollment by 14.2%, reduced the probability of dropping out by 7.5%, and increased school attendance by about 1.3 days a month. Impacts on learning outcomes were seen as well. The program was inexpensive, costing USD $18 per child per year (Ahmed, 2004).

4.1.3.4 Human Resource

It was a general concern in all provinces that the overall capacity of health care providers for nutritional assessments is very low, and the existing medical and allied health sciences curricula do not include rigorous nutrition topics. In addition, periodic refresher trainings for health professionals is not common practice, which further adds to problem.

In addition, there is a paucity of qualified and trained nutrition experts within the public health system. In this regard, stakeholders in GB highlighted that not a single nutrition expert is available at primary or secondary level health care centers. Due to a harsh climate, tough terrain, the security situation and unavailability of higher educational opportunities, regions like GB and FATA have suffered a "brain drain," which is evident from their understaffed health care centers. PDHS data in 2013 revealed a 30% out-migration rate for GB. Stakeholders expressed that appointments for nutrition programs are politically-driven rather than based on merit. Regional stakeholders also felt that there is a general lack of motivation and resolve for better performance at the district level, since there are no performance appraisal systems.

Limited coverage by LHWs was also highlighted as a challenge for implementation of nutrition-specific and nutrition-sensitive programs in remote areas of the country, especially in rural Sindh, KP, FATA, GB and Balochistan. Data from the Sindh Health Sector Strategy 2012-2020 showed coverage of 45%. The overall LHW coverage ranges from a low of 23% in FATA to 68% in Punjab. Security concerns limit female mobility and patchy population distribution also influences the low coverage. Integrating LHW services with the BHUs is uneven due to weak referral systems. Furthermore, the group in Sindh highlighted that constrained capacity of LHWs can be attributed to the absence of logistics and a conducive environment. For example, for growth monitoring, LHWs usually do not possess separate adult and baby weighing scales, have outdated or broken scales. LHWs also receive irregular disbursement of salaries, adversely affecting motivation (Peers for Progress, 2013). Rapid turnover of management in the LHW

program also hindered effective leadership (OPM, 2009; Wazir, Shaikh, and Ahmed, 2013). Stakeholders from KP highlighted that deficient supervision and inadequate refresher trainings for LHWs are key factors related to underperformance. Some stakeholders in the regions stated that LHWs are overburdened due to involvement in other governmental programs like Expanded Program of Immunization, but others disagreed, stating that these activities are planned only once a year.

4.2 Recommendations

For each of the gaps listed in section 4.1 we present here a set of recommendations that may assist in improving food security and nutrition outcomes. The first section provides recommendations related to both nutrition and food security, while as in the gaps section, the latter two sections are specific to food security and nutrition individually.

4.2.1 Recommendations for Common Areas in Food Security and Nutrition

This section outlines some of the main recommendations that are common to food security and nutrition. These suggestions relate to improving policies and governance structures, enhancing data sources, identifying resources, improving food accessibility, and empowering women.

4.2.1.1 Finalize Policies, Implementation Rules and Governance Structures

To achieve food security and adequate nutrition, concerted efforts are required at the federal and provincial levels to put relevant policies in place and to ensure their effective implementation. Therefore, our *first* recommendation is to speed up the policy development processes, for example agriculture policies in Punjab, Sindh and Balochistan, and food fortification legislation for oil and wheat flour. Similarly, the National Water Policy needs to be approved, with active involvement of the major stakeholders. Furthermore, GB, AJK, and FATA are lagging behind in the adoption of integrated PC-1s for MSNS policies.

Second, policies that have been finalized and approved need to be followed through to implementation. In many instances, policies have been adopted, but have not been backed with sufficient funding, implementing institutions, or technical capacity to allow for their implementation. For example, rules of business and the necessary legislative framework for the implementation of the Seed Amendment and Plant Breeder's Rights Acts have not moved very far. The Breastfeeding and Child Nutrition Act and the Salt Iodization Acts have not been implemented in the absence of rules or means of enforcement. Similarly, while there is legislation related to food quality, food authorities that need to enforce these laws have not been established in some regions and are inadequate in others. Most importantly, rigorous accountability measures need to be strengthened if these policies are to be successful.

To ensure that policies are fully implemented, structures like the Agricultural Commission chaired by the Chief Minister of the Punjab should be notified to provide oversight, once policies are finalized. The composition of such commissions will need to be carefully constructed.

With regard to nutrition, our *third* recommendation is that the ongoing efforts under the MSNS should be given time to bear fruit, as the extent of the gaps in programs, funding levels, and commitments still

remain to be seen. Whenever possible, evaluation mechanisms must be set up along with baseline data. A rigorous and evaluative procedure should be used to put good programs into core funding for longer-run impact and scaling up when outcomes support it. The issue of frequent leadership reshuffles and political changes threatening the sustainability of nutrition policies and programs was raised during the consultations. Evaluation mechanisms along with methods to scale up promising activities could protect sound programs against such personnel and other changes.

Very significant government funding goes into the agricultural sector, often in terms of poorly-targeted subsidies, but institutional development is much farther advanced in nutrition through the MSNS, SUN Secretariats, and related international partners' engagement. While associated departments and ministries have separate mandates, our *fourth* recommendation is that they also should have better interactions, as they have common goals to raise inclusive growth, reduce poverty, and improve nutrition and health. Mechanisms for coordination should be put in place to ensure sustainability and long-term institutionalization. While housing the MSNS in the P&D departments appears appropriate, to ensure the highest level political commitment for nutrition it might be useful to put the SUN Secretariat in the Prime Minister's office (and Chief Ministers' offices in the regions). The SUN units also provide an effective platform to include a diverse representation of stakeholders, including the public sector, private sector, academia, and civil society. This would ensure that all policies are based on strong evidence, while engaging the private sector is critically important for garnering the needed financial investments.

4.2.1.2 Enhance Data Sources

Improvements in the quality and quantity of data are essential to achieve the goal of reducing hunger and malnutrition. Reliable data are needed to set baselines, identify effective public and private actions, set goals and targets, monitor progress, evaluate impacts and help policy makers.

This review proposes that several changes can be made in the short term. According to the Pakistan Bureau of Statistics (PBS), amendments to the HIES questionnaire are underway to address the issue of under-coverage of consumption. This process could be an opportunity for other government and development partners, such as the SDG units in the MoPDR and UNDP, to work closely with the PBS and urge the inclusion of other key development indicators. The SDG collaborations are key activities for ensuring that data collection, monitoring, and strategic decision-making using evidence-based approaches are at the forefront. Analytical tools should be developed from the baseline data that are collected. Two examples are in the earlier Food Security Task Force report from 2009, which proposed that two analyses be reported on in regular intervals, namely the Food Security and Terms of Trade indices. An updated Food Security Index was presented in Chapter 2. The FAO Integrated Phase Classification system is also a good starting point.

In the medium term, within five years, several other data series could be added. *First*, keeping in mind resource limitations, the collection of consumption data on an individual level every year may not be feasible. However, a modified HIES survey could be administered that collects individual-level food consumption information on all men, women, and children within surveyed households, maintaining consistency at the district level, perhaps every three years. This approach would capture any intra-

household disparities in consumption and would inform the government about exactly who are the most food-insecure in terms of location, age, and gender. *Second*, at present all three major surveys on nutrition focus on pregnant and lactating women and children, but data are not collected systematically on the nutritional status of other population cohorts, especially adolescent boys and girls, the elderly, and the unreached. Survey planners need to consider finding ways to add these groups. For a country like Pakistan where malnutrition is alarmingly high, we also propose a robust nutrition surveillance system to assess the level of malnutrition. More details are presented in section 4.2.3 regarding recommendations specific to nutrition.

Implementation Research to identify gaps in current programs is a *third* critical aspect needed to improve the impacts of nutrition and food security programs. The best approach is to pilot evidence-based interventions through implementation research in order to demonstrate feasibility and to identify bottlenecks for full-scale implementation. Scale-up of donors' support for such research could be quite beneficial in that these expenditures naturally end when the research is done, and the government would tend to underinvest in such efforts.

4.2.1.3 Finding Fiscal Space to Invest in Nutrition and Higher Payoff Programs.

First, in the short term, government should invest more in nutrition-specific programs through external resources. They are doing this in nutrition through the Multi-Donor Trust Fund (MDTF), as there are nutrition- specific programs in KP, Sindh, Punjab, and in AJK. In the medium term, spending envisioned for subsidies is better invested in nutrition and agricultural R&D. In the long term, the agricultural support system could become more self-sustaining with reduced subsidies, an agricultural income tax, and revenues from sales of research products such as seed varieties.

Therefore, *second*, we recommend that governments at both federal and provincial levels shift spending in unproductive subsidies to nutrition-focused and productivity-enhancing agricultural R&D. This shift can be done with relatively little cost through better targeting and by reducing subsidy amounts to larger farmers. While making such decisions, it needs to be kept in mind that reducing the mortality of one child yields a stream of benefits lasting more than 40 years, while providing a cash payment for one acre of farm production simply supports farmers for the given year.

Total direct federal and provincial subsidies that are focused on agriculture are in the range of PKR 56 billion. Another PKR 336 billion was estimated to go into indirect support of agriculture each year (Davies et. al., 2017). Reallocating a small fraction of these sums could have major impacts. We found that a complete package of 13 nutrition specific interventions that address these areas would cost an average of PKR 16 billion per annum. It makes sense to raise these costs to include improvements needed for the LHWs and food departments, and other organizations who act as delivery platforms, which might make total costs closer PKR 40 billion per year, or 10% of the value in subsidies shown above. Hence, the cost of nutrition interventions is extremely low in comparison to the cost of doing nothing, and has high payoffs. On the higher side, assume the cost of interventions per child to reduce stunting in children under age 2 is PKR 9,711 there are about 11.6 million children under 2. (Hoddinott et al., 2013). For the same 10% of subsidies over 4 million children could receive the stunting reduction

intervention. Well-designed programs that target the most vulnerable children could eliminate much mortality. An estimated PKR 236 billion in net present value comes from saving infants through the various nutrition programs and enabling them to eventually join the work force (WFP, 2016; Saeed et al., 2017).

Most stakeholders from the regions were of the view that their regions did not benefit from the current distribution formula of disbursing funds under the 7th National Finance Commission award, since population still had greatest weight (82%). Therefore, it was recommended that needs-based funding be allocated, with a priority for vulnerable districts. For example, stakeholders from GB stressed that despite the severity of food insecurity in Astor district, hardly any funds were being allocated there.

4.2.1.4 Improving Food Accessibility

Promoting Inclusive Growth. As already stated, affordability must improve to ensure food accessibility, which in turn requires sustained and inclusive growth in incomes. Saeed (2017) discusses strategies for inclusive growth that target different sectors of the economy. She finds that productivity growth in agriculture and agriculture processing reduces poverty more than any other factors except for education and health (combined with housing and public administration). Sustained long-run productivity increases in agriculture serve the goal of reducing poverty by both enhancing food affordability and improving food supplies.

Improving Social Protection. There are many social protection programs, but they are diffused, possibly overlapping and need careful review. The *first* step**,** therefore, would be to evaluate current and past programs for potential coverage, costs, and likely benefits. In addition, the value of cash transfers under BISP, the country's largest social protection program, is PKR 1,566 per month, which is generally not enough to ensure affordability of a nutritious diet. However, the cash transfer does have numerous positive impacts on women's empowerment, short-term malnutrition (wasting), and the intensity of poverty. The introduction of supporting components as part of a graduation strategy would link the unconditional cash transfers to the attainment of human development goals, which would be a positive step in the direction of social protection in Pakistan being "promotive" rather than just "protective." Our *second* recommendation for the short- to medium-term, therefore, is to increase the monetary amount of BISP payments and, after adequate evaluation, expand the availability of graduation and nutrition components to all BISP beneficiaries.

Despite continued and enhanced efforts by the government for social protection since 2008, there are still unreached segments of the population that remain highly vulnerable to food and nutrition insecurity. Given the variance in characteristics of different pockets of the unreached population, these groups would require specific targeting at least in the medium term. Our *third* recommendation, therefore, is recognizing that differences in socioeconomic characteristics of vulnerable groups are best served by well-targeted and carefully designed policies.

Given the alarming poverty and malnutrition rates, narrow or targeted social protection may not be the most sustainable strategy in the longer run. Rather, progressive universal social protection schemes, such as child grants, may be more suitable, since programs with increased coverage would have the

greatest scope of being nutrition sensitive. *For the longer term*, we recommend the adoption of universal social protection programs that include a well-designed nutrition-sensitive component. Such schemes could be built upon and check progress and effectiveness against the upcoming new National Socioeconomic Database, developed under BISP.

Improving WASH Facilities and Performance. Recommendations for WASH include, *first*, interventions to achieve improvements in the quality of drinking water through increased availability of safe drinking water and raising awareness about water treatment methods. *Second*, the eradication of open defecation should be a priority, as this practice is closely associated with stunting arising from diarrhea. *Third*, we recommend caution in that many WASH investments, which can be expensive, do not have direct effects on nutrition. For example, improving access to water has a range of benefits, including time and energy savings for women and children, and lower diarrhea prevalence (Cumming and Cairncross, 2016). However, whether this leads clearly to reduced stunting has not been established. Therefore, care is needed in choosing to make these investments, with evaluations of the effects on health.

Creating Dynamic Marketing and Distribution Systems. At present, there is a lack of storage facilities, only a small percentage of produce is processed, and post-harvest losses are very high in perishables, thereby limiting dietary diversity. The *first* recommendation is to focus on changes that can be made in wheat storage and distribution. Pakistan's economy loses PKR 6 to 7 billion per year because of the lack of adequate wheat storage; using bulk grain storage and handling would be far more profitable than maintaining the current bag system in Pakistan. Public-private partnerships might be a better option, and innovative approaches, such the Government of Punjab food grain silo project, where the government guarantees a minimum storage utilization rate in storage facilities owned by the private sector. This approach could be the basis for a more market- based way to manage public grain reserves, and engage in price stabilization using a rule-based price band rather than *ad hoc* interventions. Making storage space available to farmers gives them greater control over when to sell their crops (Minot, 2017; WFP, 2013).

Second, we recommend that the food departments and authorities take on broader roles. They could add distribution of SNFs and design subsidy programs to buy food for low income families by using wholesalers, utility stores, and BISP. Because the food authorities are new in most provinces, they lack capacity; but on the other hand, new functions could be added without encumbrances from long-standing interests. They could expand into programs to increase dietary diversity by procuring vegetables, fruit and other nutritious foods from contracted (and possibly small) farmers that can be delivered to local markets to be released under various subsidy schemes or to other outlets. These programs, in effect, would develop "short value chains" using local farmers to enhance nutritious food in the local market (IFPRI, 2016). As these products are harvested after wheat, the food departments may have excess capacity when they are harvested to take on the added role. These approaches can be used to encourage food and diet diversity within remote areas where the costs of delivering from other areas is high.

Our *third* recommendation is to do a complete review and evaluation of the way forward for the distribution and processing sector. This review would include focused strategies to improve fortification, reduce losses, and encourage more diverse production. The ideal way to get the greatest benefits from the marketing system would be to have a progressive, market-driven private sector in these value chains. For a number of reasons, the likelihood of involving the private sector in this way seems low at this point. Many people object to the excessive role of government in the sector and point to suspicion (and maybe fact) about the "monopolistic middleman," the low added nutritional value in most processing, and an apparent reluctance by the private sector to invest. Thus, it appears that relying on the private sector alone is premature.

There are innovative approaches to be considered in addition to utilizing food departments. Cooperatives, international agencies, or food companies, when identified, can be encouraged to utilize contract farming, particularly for the cultivation of fruits and vegetables that have high perishability. In addition, nutrition-sensitive agriculture, such as the facilitation of kitchen gardening and small-scale vegetable farming and provision of food-handling training (preservation and storage) for farmers, especially females, can be encouraged through producer groups that sell to processors. Moreover, many processors involved in flour milling or iodized salt are small and unregulated, and thus finding ways to raise fortification and quality control within this structure needs close evaluation.

Promoting Food Safety and Quality. Recognizing that much of the food processing industry is still traditional and small-scale, the recommendation is to look at ways to promote food safety and quality and yet still enhance competition and efficiency in the industry. Milk production and distribution, for example, are in need of quality monitoring, as the vast majority of milk is distributed via traditional loose milk distribution systems and retail shops. Hazard Analysis and Critical Control Point procedures for fresh fruit and vegetables are necessary for sustainability in production and to reduce health vulnerabilities. To achieve food safety with minimal processing, small firms, and unregulated markets, collaboration is needed among health administrations, food control departments, trade organizations, academia and the private sector. Furthermore, while implementation of legislation is the responsibility of government, citizens can also play a vital role by complaining against false warranties, misbranded food, and incomplete or wrong labeling.

4.2.1.5 Empowering Women

Participants in regional consultations suggested a number of ideas to empower women in their communities. In AJK, for example, the Social Welfare and Women Development Departments are working together to create a strategy that integrates various nutrition-sensitive initiatives. Likewise, it was suggested that the food, livestock, and agriculture departments need to collaborate with the Women Development Department to improve microfinance options for gender-sensitive nutrition programs, such as kitchen gardening and dairy farms. Additionally, women should be included in agriculture and nutrition policymaking and should be given leadership in nutrition-specific and -sensitive programs. Female nutrition champions who understands cross-sectoral approaches should be identified to support the MSNSs.

It is important to devise policies that specifically aim to increase the decision-making power of women and provide resources for them to generate their own income. Interventions can focus on the following:

- Giving women an increased role in deciding which crops to cultivate, which could be achieved by running a pilot test with an addition of a nutrition-sensitive component to BISP;
- Increasing investment in rural business and enterprise development services for women, in particular in areas where women can easily participate and where large land holdings are not required (e.g., poultry and dairy farming, small ruminants, kitchen gardening);
- Investing in interventions that bring positive change in the household power structure to give women more autonomy and mobility and the ability to make important decisions regarding income-generating activities and food for the household;
- Ensuring that community-led structures recognize that women must be included in nutrition policy-making and programs; and
- Giving the new nutrition cells in the P&D departments in Punjab and Sindh responsibility for reviewing proposed projects for gender-sensitive as well as nutrition-sensitive components, as currently being done in KP.

4.2.2 Recommendations for Areas Specific to Food Security

4.2.2.1 Increasing Food Availability

It is imperative to exploit the full potential of agriculture to feed the population, encourage inclusive and sustainable agriculture growth (as argued in Saeed, 2017), and increase incomes for small farmers in particular. *First*, in the short term, the government could work on better information provision, and provide up-to-date literature on climate-specific and other issues for crops and livestock, increase contacts with producers through registration, farmer field schools, and demonstration centers. Additionally, the government could engage the private sector to provide agricultural extension and price information to farmers.

Second, for the medium term, many options were proposed in the regional consultations. With regard to capacity building in government, stakeholders recommended evaluating and expanding the role of farm service centers (in KP, where the system is most developed), cooperatives, and veterinary and other extension workers. Programs can be added as well, such as index-based crop and livestock insurance schemes to protect especially smaller farmers; transition from conventional to ICT (information and communication technology) based programs to support mapping and zoning of agriculture; opportunities in cluster-based approaches to agriculture; and expanding the E-Card credit facility from Punjab to other provinces. Other recommendations from the regional consultations included mobile veterinary services to cover remote and high pasture areas of the country; improved livestock vaccination systems through cold boxes; milk collection centers; and better genetic potential of indigenous livestock.

Many of the above suggestions were proposed as ways to raise productivity and incomes in farming. A central institution is increased performance of agricultural research. So, t*hird,* the links among research institutions, extension workers, rural development associations, and farmers can be improved through

the development of provincial agricultural research boards to investigate many ideas from the consultations. These ideas included drought-tolerant varieties, high-value crops and pulses, and innovative water-conservation techniques, such as drip irrigation, small dams, water ponds to improve aquifers, and water harvesting in rain-fed areas.

Fourth, the role of public-private partnerships needs to be pursued aggressively. A major one is to develop a seed distribution system that supports private and public sector development activities. Other examples are to establish service centers for production of inputs for fisheries, efficient cold chain systems, and establishment of fish feed production units and hatcheries. Also important is to encourage community engagement for watershed and communal/rangeland management to increase availability of vegetation. Proper rangeland/pastoral land titling should be ensured to reduce overgrazing, along with proper education of local communities to manage rangelands. These measures are especially needed in AJK, GB, Balochistan, and parts of KP, Punjab, and Sindh, where most of the population is dependent on farming and particularly on small ruminant livestock.

4.2.2.2 Improving Sustainability

First, in the short term, resilience planning should include education and awareness-raising in communities to tackle unforeseen events. However, in the medium and long term, the role and effectiveness of local institutions, such as health care services, agricultural extension, credit services, and marketing need to be promoted in order to build the resilience of households. *Second,* to deal with uncertain events in the medium term, the government needs to invest in disaster preparedness and create programs and early warning systems that are understood by all stakeholders – such as departments, farmers, and livestock holders – and contribute to long-term disaster prevention and reduction strategies. International humanitarian and development actors can assist financially and provide technical knowledge to reduce future risks by helping engage local neighborhoods, municipalities, urban planners and the private sector, among others, at various scales.

Third, a transition is crucial in the longer term to move from logistics to strengthening networks in the supply chain. For the National Capacity Strengthening program, WFP is working with the NDMA, the Provincial Disaster Management Authority (PDMA), and other organizations to provide technical assistance for humanitarian response facilities throughout the country. WFP also provide training to staff for maintenance, warehouse management, institutional support and technical assistance. The networks that support these facilities need to be expanded at the Union Council level for rapid humanitarian response. Also, assistance is needed to improve the efficiency, capacity, and monitoring of the NDMA for effective delivery of humanitarian services and to improve disaster response systems (Polastro et al., 2011).

4.2.3 Recommendations for Areas Specific to Nutrition

The gap analysis for nutrition discussed in Chapter 3 and previous subsections of Chapter 4 show that their challenges require action on several fronts. This section provides implementable recommendations specific to nutrition, including improvements in awareness, programs, and human resources.

4.2.3.1 Improving Awareness, Education and BCC

For long-term and sustained impact, behavioral changes are necessary to promote healthy behaviors in general and to eliminate both acute and chronic malnutrition specifically. *First*, a comparative analysis is needed to identify the best integrated BCC approaches that are context-specific and culturally appropriate.

Second, we recommend a sustained and comprehensive publicity campaign to build awareness on the benefits of breastfeeding children up to 6 months (prevention against stunting, infectious diseases, etc.) and for the mother herself. Successful examples of BCC strategies from neighboring South Asian countries (India and Bangladesh) for stunting reduction and improving breastfeeding need to be adapted to Pakistan's context. BCC strategies used for the Polio Program in FATA were a local success story that could also be adapted to nutrition programs. Some of the dimensions that should be evaluated include how to prioritize nutrition campaigns in print and electronic media (as was done for the Polio Program) and what formal and informal social structures can be effective for promoting health and nutrition knowledge at the community level. *Third*, a new initiative to build capacities through academic detailing of the outreach institution (the LHWs) and front line health care workers for effective nutrition counseling. Knowledge of early and exclusive breastfeeding, and the importance of nutritious complementary food need to be in place immediately.

4.2.3.2 Improved Nutrition Programs

Enhanced Nutrition Surveillance Systems. *First,* a robust surveillance system for nutrition is needed, which should have the coverage to reach the most disadvantaged populations and vulnerable groups (lactating and pregnant females and children under the age of 5). The system should remain within the health surveillance system, but coverage should be bolstered by recruiting more LHWs. The logistics and supplies (weighing and length scales) need to be provided to LHWs, and their capacity should be built for assessing stunting (training for length measurements). To fund the initiative, government should reallocate funds from agricultural subsidies to nutrition (discussed at length under Section 4.2.1.3). In addition, partnerships can be established with institutions like the RSPs. In collaboration with NI, the RSPs are in 19 districts of 3 provinces using community resource persons to reach areas not covered by LHWs with programs to enhance IFA supplementation. Community groups could also help identify resource persons on a voluntary basis to support surveillance activities in hard-to-reach areas.

Second, to support the surveillance system, core nutrition indicators need to be incorporated in the DHIS across the board. In addition, primary health care facilities should be provided with computers, human resources and the means (including Internet links) for sharing data with district and provincial health facilities in real time. These facilities also will help accelerate the implementation and effective functioning of the DHIS.

Effective Nutrition-Specific Programs. Any programming for nutrition should utilize strategies to prioritize communities in greatest need so that positive outcomes can be achieved most effectively and quickly. Peru offers a successful case study in which a combination of prioritized investments in the neediest communities, multi-sectoral actions, conditional transfers, and high-level commitment allowed

stunting rates to decline from 22.9% in 2005 to 17.95% in 2010 (Acosta, 2011). For Pakistan, our recommendations below follow the time path of a child's development.

First, for 0-6 month old infants, nutrition counseling is the major intervention needed to improve exclusive breastfeeding. This counseling can best be done by LHWs and through breastfeeding-friendly primary health care centers. Part of this effort is building awareness, which is particularly low regarding the benefits of breastfeeding. We recommend a sustained and comprehensive publicity campaign to build awareness and to make counseling more useful. Nutrition counseling should be implemented at primary health care centers, and breastfeeding corners should be established.

Second, provision of SNFs to 6-24 month old children in vulnerable populations can help immensely to tackle stunting. Starting at six months, children progressively need foods of greater diversity, but many parents lack understanding of the nutrients required, or how to provide a diverse diet, or lack income to afford such a diet. Thus, careful design of complementary foods and use of nutrient dense foods is required. To take steps forward, children between 6 and 23 months must be identified in communities. The network of the LHWs and BHUs could lead this effort, but each would require enhanced capacities for data collection and screening for stunting. Delivery platforms also are needed to disburse nutritious foods regularly and sufficiently. Examples of these platforms could be LHWs, RSPs, food departments or BHUs, depending on the situation and location.

Third, since most mothers and children from 24-60 months do not have sufficient food intake and variety, micronutrient supplements are needed to tackle undernutrition effectively. According to the World Bank, IFA supplementation for pregnant women and school-aged girls has the highest value among eight nutrition-specific interventions. The same delivery platforms discussed above can be used for implementation.

Fourth, all forms of malnutrition can also be targeted by building food production capacities at the micro/household level. Stakeholders suggested nutrition-sensitive agricultural initiatives such as facilitating kitchen gardening, small-scale vegetable farming, food storage and preservation at the home/farm-level, and training of female farmers. These initiatives would not only enhance dietary diversity but also improve households' and women's economic independence.

Fifth, nutrition programs should include interventions to sensitize men towards women's health issues, and to identify and empower female champions for change at both household and community levels. Regional stakeholders said that women must be seen as both targets of interventions as well as agents of change in the community. Evidence from the PDHS 2013 supports the idea that empowering women is an effective pathway for positive health and nutrition outcomes. For example, women who are empowered are more likely to use contraception (33.1%) compared to those who are not (18.8%), and they are more likely to seek ANC (74.4%) compared to those who are not (68.5%).

Using School Nutrition Programs. School health programs that offer a comprehensive nutrition package were proposed by stakeholders to address micronutrient deficiencies and improve dietary diversity. Pakistan has a history of poorly-implemented SFPs. However, Bangladesh provides a contextually similar but successful case study in which an SFP was implemented in chronically food-insecure areas. These

programs could be used to encourage greater consumption of fruit and vegetables and less consumption of sugar, fat and salt, while promoting increased physical activity. These programs are also known to make small contributions to linear growth potential and may prevent the continuation of the stunting process in older children. Such programs, by increasing girl enrolment, also can be initial platforms for women's empowerment. Through these programs, additionally, teacher trainings can be restructured to include basic nutrition education and WASH modules.

It is also important to recognize nutrition as a necessary factor for building resilience as part of disaster preparedness. Thus, households vulnerable to shocks should be prioritized to achieve nutritional outcomes that are sustainable.

4.2.3.3 Human Resource Development

There is limited capacity regarding nutrition among existing health care professionals and a dearth of nutrition experts within the development sector. Without skilled resource persons, the impact of nutrition interventions and the enforcement of relevant policies will be limited. Stakeholders in all regions recommended the creation of dedicated nutrition positions in programs and the hiring of qualified nutrition experts. To achieve this goal requires long-term human resource development initiatives.

First, curricular standards and requisites on nutrition competencies need to be established and made a mandatory part of medical education and training. A universal nutrition curriculum across provinces will ensure consistent and accurate nutrition messages for the population. *Second,* evaluations of existing nutrition-related community programs suggest a need to develop a revised training curriculum and conduct in-service refresher trainings. *Third,* the LHW system needs significantly better support to expand coverage to remote areas of Sindh, KP, FATA, GB, and Balochistan to reach vulnerable groups. It also must integrate services better with BHUs, have appropriate and functioning weighing and length scales, and ensure regular disbursement of salaries. A *fourth* recommendation is to undertake an analytical exercise to examine the M&E mechanisms needed for improved organizational and individual performance and accountability.

5 RECOMMENDED IMMEDIATE AND LONGER-TERM FOOD SECURITY AND NUTRITION PROGRAMS

5.1 Introduction

This Chapter presents priority activities from the recommendations in Chapter 4. These priorities are separated into two sections reflecting immediate and longer-term activities that could be implemented, depending upon funding. Section 5.2 recommends activities for immediate implementation that have demonstrated evidence of success, clear economic benefits and delivery platforms or institutions that can be used immediately. The World Bank (Shekar et al., 2017) finds that "Scaling up nutrition-specific interventions would result in a reduction of 19.5 percent in the number of stunted children in the 37 high-burden countries by 2025." These interventions would reduce the stunting rate by about 9% and thus take the country halfway to the SDG goal. Therefore, both nutrition-specific and sensitive interventions are needed to reach the broader food-insecure population and to ensure availability and affordability of nutritious food in the longer run. Even though the recommended nutrition-sensitive interventions focus on the longer term, it is necessary to start now and begin to address the challenges to ensure food and nutrition security in Pakistan in the future. Therefore, we include some of these priorities in the list of immediate interventions. The list is split to identify interventions that mostly focus on nutrition versus food security. Section 5.3 presents options for programming that have longer-term payoffs.

As these programs and initiatives are presented, the geographical and human distributions of nutrition and food security deficiencies need to be kept in mind. Undernutrition rates, while generally high in each region (and in WHO's Very High Prevalence category) are particularly high in Balochistan and Sindh. A quarter of women in Sindh are underweight, and 58% of its children either stunted, wasted or both. Similarly in Balochistan, 22% of women and 56% of children show signs of undernourishment. The issue is compounded further in Balochistan with a significantly higher rate of (multidimensional) poverty at 72%. FATA is also particularly disadvantaged, with 54% of children being stunted, wasted or both (other data were unavailable). KP also has a high rate of stunting/wasting, at 57%, but the incidence of underweight women is the lowest in Pakistan, at 9%. The remaining regions (Punjab, AJK, and GB) fare better, with stunted and wasted children under 50%, and underweight rates among women below 20%.

However, we first note several overarching points that should be considered under all recommended programs or policy developments.

- **Establish a nutrition and food security surveillance system** in line with SDG targets and indicators. A population-level nutrition surveillance system is needed to assess malnutrition, and it should be embedded in a broader food security monitoring system, which integrates agricultural production, market information systems, and monitoring of vulnerable groups to provide a holistic picture. Food security and other indices can be regularly reported to SDG units and to the various departments, perhaps through a cell in the P&D departments, to give trend analyses and early warning of food and nutrition emergencies.

- **Develop a culture of M&E, and implementation research** to identify gaps in current and proposed programs and to improve the impacts of nutrition and food security programs.

- **Identify and empower female champions for change** at the household and community levels to help ensure the success of all programs and implementation structures. Review programs to determine if women have income generation opportunities, the potential to be part of policy and decision-making bodies, and other possibilities to empower and educate them. Without this change, many dimensions of food security and nutrition are unlikely to improve.

Specific recommendations and priority actions suggested for each region can be found in the appendices.

5.2 Food Security and Nutrition Programs for Immediate Initiation

This section summarizes interventions that can be initiated soon, with appropriate commitment and adequate funding that could come from government through budget reallocations. They include a combination of nutrition-specific and nutrition-sensitive proposals. The first priority should be to address issues for pregnant women and infants, as the human and economic costs are highest and most long-lasting. Moreover, most interventions recommended below have evidence for a potential success and economic payoff.

The first three recommendations are nutrition-specific activities:

Promote exclusive breastfeeding. Breastfeeding for the first six months provides a child with adequate nutrition, when the mother is well-nourished, and gives protection from contaminated food, water and infectious diseases. Breastfeeding programs are by far the most cost-effective action in South Asia, according to the World Bank, as every dollar spent yields impacts worth USD 37. Infant and child nutrition counseling is the major intervention needed to improve exclusive breastfeeding rates, and can best be done by an expanded corps of LHWs and primary health center staff. The counseling capacity of these front line health care workers would greatly benefit from academic detailing sessions. One requirement in this effort is building awareness, which is necessary but rarely sufficient. A sustained and comprehensive publicity campaign is necessary to make counseling education more useful.

Provide SNFs through BHUs and other community locations to manage malnutrition more effectively and to enhance the nutritional food available to children and mothers. Starting at six months, children progressively need more food of greater diversity, but they cannot eat much, and many mothers lack understanding of the nutrients required and the importance and availability of a diverse diet. Careful design of complementary feeding approaches and use of nutrient-dense foods is required. To take steps forward, children between 6 and 23 months must be identified, most likely by LHWs and BHUs, if capacity for data collection and follow-up can be enhanced. Then, nutritious foods must be provided frequently and in adequate amounts. This requires delivery platforms that can meet these requirements. These delivery platforms could be RSPs, food departments or BHUs, depending on the situation and location.

Invest in micronutrient supplements. Because mothers and children often do not have sufficient food intake and variety, supplements are needed. Iron is an important supplement for pregnant women and school-aged girls, but is not currently provided outside of selected projects. The World Bank shows that in a list of eight nutrition-specific interventions that reduce malnutrition, the most impactful per dollar spent is antenatal supplements to pregnant women, which yields USD 29.10 in benefits for each dollar spent. A range of supplements of iron, vitamin A, folic acid and zinc all have about USD 15 in benefits for each dollar spent, mostly in benefits for children. The same delivery platforms discussed above are relevant, as are the challenges faced in reaching and supplying these supplements.

The next activities are related to food security, but also support improved nutrition:

Encourage fortification and other roles for provincial food authorities/departments. An alternative to providing supplements is to fortify staples as they are processed, such as processing of wheat into flour, or from bio-fortified commodities, such as zinc-fortified wheat. The provincial food departments have managed wheat distribution programs for many years and could be good institutions to help with complementary feeding and food programs for unreached and food-insecure populations. Food departments typically purchase wheat from farmers at a guaranteed price and release it to flour mills at subsidized rates, which shows that they have experience in large and complex distribution programs. It could be a relatively small step to add micronutrients to fortify wheat, for example. Using wholesalers, utility stores, and BISP – the latter to assess eligibility and provide nutritional education – these departments could manage programs to increase dietary diversity by procuring vegetables, fruit and other nutritious foods for local markets from contracted (and possibly small) farmers using various subsidy schemes. Such programs would, in effect, develop “short value chains” using local farmers to enhance nutritious food in a local market (IFPRI, 2016).

Expand social protection to reduce poverty and enhance nutrition. Nutrition goals can only be accomplished in the short-term by expanding social protection, most likely by increasing BISP payments. Currently, 5.7 out of 7.7 million eligible families are given PKR 18,800 per year, and evaluations show that poverty declined by about 3%. To extend this outreach by another 2 million families and raise the payment by 20% requires PKR 66 billion, a large but affordable cost given current expenditures in other less-productive areas. BISP is exploring ways to expand its graduation programs and nutrition education. For example, BISP signed an MoU with Nestlé Pakistan to distribute a variety of SNFs via local agents who are also beneficiaries. BISP, WFP and the Punjab government also started a project to provide 6-23 month old children with nutrition supplements and BCC through Primary and Secondary Health Departments in Punjab, with LHWs used for nutrition education and BCC. In addition, BISP is piloting new funds withdrawal options such as biometrically-enabled Automated Teller Machines (ATMs) and bank branches, as well as door-step delivery to make delivery of funds better targeted and more effective. Apart from BISP, NI is working with National Rural Support Program (NRSP) to reach uncovered populations, so organizations like the RSPs are a third option for better reaching the poor.

Leverage media to promote breastfeeding and other best practices that suffer from a lack of awareness, such as avoidance of open defecation, benefits of supplements, and importance of nutritional awareness**.** Household dietary intake is dependent on numerous factors, with female

education and nutritional awareness playing a vital role. The knowledge of the general population about concepts like minimal acceptable diet, appropriate feeding frequency and dietary diversity is extremely poor, even in the wealthiest quintiles. Media promotion alone will not change behavior, but it will raise awareness, which will enable behavior change activities to be more quickly effective.

Shift agricultural subsidies to help decrease food prices and invest in nutrition. Food prices are high despite current surpluses in major crops, and a nutritious diet is out of reach of many families, partly because some government policies lead to prices of key staples higher than international prices. Additionally, subsidies on wheat, fertilizer and water benefit larger farmers, and then the government is forced to make greater expenditures on social protection to offset poor performance in agriculture. Subsidies need to be shifted from agricultural inputs and marketing to R&D, policy implementation, and support of productivity-enhancing investments. As described in Chapter 3, achievable growth in yields are possible that can lead to sufficient domestic availability and contribute to export revenues.

5.2.1 Supporting Institutional and Analytical Programs

This section discusses some of the policies and programs that are needed to support the priority initiatives discussed above.

- **Strengthen capacities of Front line Health Care workers in Nutrition.** LHWs and the primary health care center staff (doctors, nurses and allied health staff) would greatly benefit from academic detailing sessions to improve their skills for breastfeeding counseling identification and management of malnutrition.
- **Strengthen supply chains.** In our list of activities recommended for immediate initiation above, the roles for provincial food departments and authorities were highlighted. In addition, a broader set of encouragements to supply chains is warranted. Two of these are outlined below.
    - **Encourage marketing, distribution and processing industries**. Beyond the food departments, a roadmap is needed for a progressive, market-driven food system with public-private partnerships that encourages nutrition-sensitive agriculture and a safe and nutritious food supply. This roadmap requires analysis related to traditional and small-scale processors, incentives to diversify, facilitation of kitchen gardening and small-scale vegetable farming, and provision of food handling training for farmers, especially women. Similar investigations should be conducted to address food safety issues.
    - **Improve food storage and distribution systems** for improved resilience and disaster preparedness. The storage and distribution system is in need of increased wheat storage facilities, which can be addressed by fostering public-private partnerships. For improved resiliency and disaster preparedness, NDMA and PDMAs should be included under the National Capacity Strengthening Program. International humanitarian and development actors can play a role in this area by providing technical knowledge and financing, and local neighborhoods, municipalities, urban planners and the private sector also should be engaged in these efforts.

- **Implement school-feeding programs (SFPs)** as a potential nutrition-sensitive intervention that can play a key role in nutrition and food security when implemented as social protection with in-kind transfers and nutritional targets. When linked to local production and agriculture, these programs also have the potential to benefit local farmers and hence achieve further indirect benefits for food security and nutrition. In Bangladesh, SFPs provided fortified biscuits (containing 75% of recommended daily requirements of vitamins and minerals) that raised children's caloric intake by 11-19% (varying by urban/rural setting) and BMIs by an average of 0.62 points. It also raised school enrollment by 14.2%, reduced the probability of dropping out, and increased school attendance somewhat, as well as having positive impacts on learning outcomes. The program was inexpensive, costing USD 18 per child per year (Akhter, 2004).

5.2.2 Supporting Policies

Policies always set development directions and the roadmaps for government priorities and investments; therefore, the status of their development is a key area in this Strategic Review. However, enacted policies also need operational rules and human resource technical capacity to design related programs and legislation, allocate funding, and ensure that relevant institutions have independence to act. Actions needed to improve the implementation of policies related to nutrition are listed below.

- **Dedicate time, commitment and funding** to **MSNS and associated institutional structures** in order to allow them to bear results. As these arrangements are just beginning, observing and tracking progress should be a major part of all stakeholders' interests.
    - **Review proposed projects for gender-sensitive and nutrition-sensitive components**. The Nutrition Cells in the provincial and regional P&D departments can take the lead to ensure that nutrition- and gender-sensitive elements are included in all relevant proposals. The line departments related to food security have greater mandates outside the MSNS, so the nutrition cells can strengthen the nutrition- and gender-sensitive components in the government development expenditures.
    - **Assess the administrative homes for MSNS**. Given the multi-sectoral dimensions of the MSNS, its management through SUN Units in the P&D departments and the SUN Secretariat in the MoPDR is correct. However, depending on outcomes after several years, to gain further political commitment and momentum for nutrition and food security, it might be advisable to move the administrative homes of the Sun Secretariat to the Prime Minister's office and the MSNS to Chief Minister's offices in the provinces. Also, it is necessary to determine whether this structure is adequate to foster food security.

- **Implement the Protection of Breastfeeding and Child Nutrition Act**. This legislation was passed at the federal level in 2002, and endorsed by the Punjab in 2012, Sindh in 2013, Balochistan in 2014 and KP in 2015. The next steps are to push this important law into tangible actions.

- **Adopt and implement Salt Iodization Acts.** Currently, GB (2011), Sindh (2013) and Punjab (2015) have compulsory iodization of salt, but the implementation of this policy must be improved. KP and Balochistan both decreed province-wide salt iodization through amendments to regulations on provincial food laws. Relevant policy or legislation is needed in AJK and FATA.

- **Enact Food Fortification Acts in all regions.** Only donor-related efforts have been made for food fortification (through Global Alliance for Improved Nutrition, GAIN, and NI) and only Punjab has mandated wheat flour fortification (in 2014). Enactment of legislation is needed in other provinces and regions for both fortified oil and wheat flour, with subsidies to ensure quality assurance by food processors and to encourage reduction in cost.

- **Adopt the Early Marriage Restraint Act,** which has so far only been passed in Sindh and in amended version in Punjab. All provinces and regions need to follow in the footsteps of Sindh to pass legislation to prohibit marriage before the age of 18, with severe penalties for any violation. Strong enforcement will help ensure delays in marriage, thereby preventing adolescent mothers from entering the intergenerational cycle of stunting and poverty.

- **Enact legislation for provincial agriculture research boards** to link research institutions, extension workers, rural development associations and farmers, and to support public-private partnerships. At present, Punjab has a Board that has a track record, and Balochistan has enabling legislation. Other regions do not, but should take steps in this direction soon.

5.3 Food Security and Nutrition Programs for Longer-term Benefits

Since nutrition-specific interventions can only reduce about 20% of stunting, other interventions, such as dietary diversity, WASH, nutrition education and increased income ultimately are needed to ensure that Pakistan is food- and nutrition-secure in the future. Many of these interventions have a longer-term focus, and direct links to nutrition are less established. Nevertheless, developed and emerging countries that perform well on these measures also perform well with regard to stunting and other nutritional and food security measures. (Some countries are, however, guilty of "overshooting" the goal, with high rates of obesity and associated non-communicable diseases.)

Although these recommendations are longer-term, steps must start now and challenges must be met in order to have any possibility of food- and nutrition-security in Pakistan, and, as such, funding needs to be balanced between these long-term efforts and immediate programs presented in section 5.2. Listed below are the priority long-term programs that should receive enhanced funding.

- **Increase growth in crop and livestock yields significantly**, at rates far above recent experience, as population growth imposes an increasing burden on productive agricultural land. Recent production growth has been driven by traditional input expansion rather than technical change, but this approach needs to change in a substantial way. Increased agricultural R&D should therefore be a

major priority, with a demand-driven and productivity-driven focus that leads to lower prices and a more nutritious and diverse food supply.

- **Enhance resilience and disaster preparedness.** Pakistan is affected by a high frequency of natural disasters as well as man-made events arising from military conflicts and political and economic instability. It is ranked as the 7th most affected country in terms of long-term climate change risk (Kreft et al., 2014), and is 13th on the Fragile States Index (FFP 2016), which focuses on military, political, economic and social risk indicators. For communities to be resilient to adverse events, and for food security and nutrition to be sustainable *at all times*, these topics must be included in disaster preparedness. This requires that disaster preparation include early warning systems, emergency food reserves, and community-based programs that teach communities to prepare for unforeseen events, which can be supported by international humanitarian and development partners. In the longer-term, a shift is required from logistical planning to strengthening and coordinating the entire supply chain and network of the NDMA, PDMAs, and District Disaster Management Authorities (DDMAs), as well as local government and other local community partners.

- **Empower women in households and communities.** As noted, interventions are needed that bring positive change in the power structure of households, particularly in income-generating activities and food for the household. One way to do this is to enhance income-earning opportunities through rural business and enterprise development services for women, especially in sectors where women can participate and where large land holdings are not required, i.e. poultry and dairy, small ruminants, kitchen gardening, etc.

- **Strengthen the LHW system.** LHWs have the most extensive interface with mothers and children. They need enhanced capacity to screen for stunting and other nutrition issues and to take advantage of significant potential for the delivery of nutrition services and awareness. Specifically, the LHW system needs significantly better support to expand coverage in remote areas of Sindh, KP, FATA, GB, and Balochistan to reach vulnerable groups and integrate services with BHUs. They also need to have appropriate and functioning weighing scales and length scales, as well as regular disbursement of salaries.

5.3.1 Supporting Policies

As in Section 5.2.1, policies are needed to set government priorities and investments. For food security, the key policy actions needed are listed below.

- **Adopt and implement agricultural policies.** So far, only KP has an agricultural policy in place, while others are at various stages of development at the national level and in Punjab, Sindh, FATA, GB and AJK. These policies need to be finalized and should balance the dual priorities of accessibility and availability of agricultural products, which is not often the case. Moreover, these policies all need effective implementing structures and associated PC-1s.

- **Finalize and implement the National Water Policy.** Issues related to water were the most often raised points in the consultative meetings during this review. A National Water Policy has been drafted to define a process for reforming the water system. As first steps, the National Water Policy should be finalized and passed, and a National Water Commission should be established with funding provided and technical experts included.

- **Implement seed policies and incentivize private sector participation.** A major intervention needed for agricultural productivity relates to the seed distribution system, with the ultimate goal of creating an industry that has a balance between the private and public sectors, in a symbiotic relationship. A National Seed Amendment was passed in 2015, and a Plant Breeder Rights Act in 2016, but their implementation has been slow and these initiatives appear to lack sufficient incentives to encourage participation by the private sector.

5.3.2 Supporting Institutional and Analytical Priorities

As in section 5.2.2, several programs and analyses will help support the proposed longer-term activities listed above. Recommended programs are listed below.

- **Improve management of rangelands** by ensuring land titling to reduce overgrazing and by educating local communities on rangeland management issues. This development is very important for remotely-located herders, agriculturally-dependent small landholders, and landless rural inhabitants in many parts of the country. Also needed are mobile veterinary and other support services to cover remote and high pasture areas of the country.

- **Introduce (or re-introduce) programs** such as index-based crop and livestock insurance schemes, ICT-based programs supporting mapping and zoning of agriculture, cluster-based approaches to agriculture, and credit facilities in all regions. In addition, it is important to improve livestock vaccination systems and develop better genetics for indigenous livestock.

- **Evaluate WASH investments carefully ahead of major investments**, as they can be expensive and not all lead to improved nutrition. Nevertheless, WASH interventions are necessary since nutrition-specific interventions alone can only reduce stunting by 20%. WASH investments focused on reducing exposure to pathogens for children under 2 are likely to be most beneficial.

- **Promote nutrition-related training** curriculum development, and coordination for all community based health workers, which lead to establishment of nutrition-focused positions for effective implementation of nutrition programs.

- **Conduct a comparative analysis of best approaches for BCC strategies** and their ability to affect stakeholder engagement, social mobilization and capacity building. The assessment should include relative valuation of nutrition campaigns, potential use of various community social

structures for promoting nutrition knowledge, and mechanisms to sensitize males on women's health issues.

- **Assess options to reach small farmers**, including farm service centers, cooperatives, private sector, veterinary and other extension programs and departments, in order to determine the most effective approaches. The success of food security efforts will depend on the choice of delivery mechanisms and whether these are able to support the majority of the agricultural sector, which is made up of smaller farms. Progressively, this effort should be taken over by the private sector, but it needs to be determined when this should occur and in what areas.
- **Examine the feasibility of universal social protection approaches** by looking at the potential coverage, costs and likely benefits, and whether well-defined nutrition-sensitive components, such as child grants, could be included.

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APPENDICES

Appendix 1: Consultation Process

The Food Security and Nutrition Strategic Review is an independent, analytical and consultative exercise designed to identify the key challenges faced by Pakistan in achieving food security and improved nutrition, and to provide prioritized areas for action for the Government of Pakistan and all humanitarian and development partners. In an effort to make the review inclusionary and to better understand implementation efforts, the technical team -- IFPRI and AKU -- met with stakeholders at the federal level, including international organizations, and at the provincial or regional level.[21] The stakeholder meetings were designed to make sure a wide range of institutions and stakeholders were included at both levels.

A.1.1. Bi-lateral Meetings at Federal Level

First, the technical team held meetings with the federal government to assess the design of the review, and to announce its purposes and timeline. This included federal entities on the advisory group, the EAD, the Ministry of National Food Security and Research, the Planning Commission, especially the SUN Secretariat/SDG Support Unit, and the Ministry of National Health Services, Regulations and Coordination. These organizations also provided representatives to attend regional meetings. These activities were completed in the initiation phase prior to meetings in the regions.

During the desk review process, the technical team also met with other development partners, including One UN and the SUN Network, to elicit information. Overall, the approach was to do the desk review and other analytical research in parallel with stakeholder discussions, so that the discussions would inform and lead to adjustments in the technical reviews.

Initial discussions and reviews of the approach were conducted with the advisory group and One UN. The discussions centered on how to address the relevant SDG targets, and provided an overview of how actions may be implemented, how they could be funded and the opportunities for leverage and coordination under the UNDAF/OP-III process. As these institutions were consulted throughout the process, a considerable scope for refinement of the approaches was expected.

A.1.2. Regional Consultations

The second sets of stakeholders were the regional governments and representatives from the private sector and civil society. Meetings in all provinces and regions (Punjab, Baluchistan, Sindh, KP, FATA, GB and AJK) were held in August - December 2017 to get feedback on the desk review and other issues related to food security and nutrition. The technical team visited each region twice, once to initiate the discussion and collect feedback and the second time to finalize the recommendations from those discussions. The meetings were structured similarly across regions, with a consistent list of discussion

[21] For simplicity, the four provinces and three regions of Pakistan are frequently referred to only as “regions” in the remainder of Appendix 1.

points addressed. This uniform approach was necessary to make sure to discuss and analyze the same themes in each region of the country. Discussions included the priority actions needed to meet gaps and accelerate progress towards the relevant SDG targets, and provided an overview of how these actions may be implemented, how they could be funded and the opportunities for leverage and coordination under the UNDAF/OP-III process.

A.1.2.1. First Round

The technical team held a two-day consultative workshop in each province and region. Facilitated by the relevant Planning and Development Department, the consultative workshops were widely attended by representatives of government, local Non-Governmental Organizations (NGOs) and the United Nations. On the first day, the two institutions that compose the technical team facilitated two separate but simultaneous group discussions on food security and nutrition. In each group, the technical team gave a brief presentation on the situational analysis of food security and nutrition in the region, followed by discussion. Both groups joined in plenary at the end of the day to share their reflections. On the second day, participants attended two sessions, one focused on food security and another on nutrition. The purpose of these sessions was to summarize the challenges, gaps and recommendations as proposed by each technical session and to gather additional feedback from government officials. Based on the desk review and input from the consultations, the technical team developed a joint *aide memoire* (a draft summary with preliminary conclusions and recommendations).

A.1.2.2. Second Round

Following the development of the *aide memoire*, the technical teams revisited the provinces and regions to present results and get endorsement of the recommendations. These generally were half day stakeholder meetings in each region, but they did not always include the same stakeholders from the earlier workshops. The purpose was to ensure that the review contains all necessary recommendations and conclusions and is endorsed by each region**.**

Table A.1-1: Regional Consultation Dates

	Province/Region	First Round Dates	Second Round Dates
1	Balochistan	August 31 – September 1, 2016	January 11, 2017
2	Punjab	September 28 -29, 2016	February 1, 2017
3	Sindh	September 22 -23, 2016	January 26, 2017
4	Khyber Pakhtunkhwa	October 5-6, 2016	December 13, 2016
5	FATA	October 3-4, 2016	December 14 ,2016
6	AJK	September 5-6, 2016	December 20, 2016
7	GB	November 2-3, 2016	January 17, 2016

A.1.3. Advisory group Meetings

Three advisory group meetings were held at different stages of the strategic review process to:

1) Approve the work plan (Date: July 27, 2016);
2) Discuss preliminary conclusions after regional consultations (Date: November 8, 2016); and
3) Review the draft report after a regional review (Date: March 8, 2017).

Table A.1-2: Advisory Group Members

	Name	Title	Organization
1	Mr. Tariq Bajwa (Co-Chair)	Secretary	Economic Affairs Division
2	Mr. Niel Buhne (Co-Chair)	Resident Coordinator	United Nations
3	Mr. Yousaf Naseem Khokhar	Secretary	Ministry of Planning, Development and Reform
4	Mr. Muhammad Abid Javed	Secretary	Ministry of National Food Security and Research
5	Mr. Muhammad Ayub Sheikh	Secretary	Ministry of National Health Services, Regulation and Coordination
6	Dr. Sarfaraz Ahmed	Scientific & Regulatory Affairs Manager	Engro Foods Limited
7	Dr. Sardar Fakhar Imam	Vice Chancellor	Fatima Jinnah Medical University
8	Dr. Abid Qaiyum Suleri	Executive Director	Sustainable Development Policy Institute
9	Prof. Dr. Iqrar Ahmad Khan	Vice Chancellor	University of Agriculture Faisalabad
10	Mr. Naseer Memon	Chairperson	National Humanitarian Network
11	Ms. Heather Macey	Country Coordinator	Pakistan Humanitarian Forum

A.1.4. National Stakeholder Consultation and UN Events

The first round of regional consultations was followed by a national stakeholder consultation on November 25, 2016, in which the *aide memoire* was presented. In addition, the technical team hosted two interactions with high-level UN officials to review the *aide memoire* and launch the Strategic Review. Participants at these events also included government officials and representatives of civil society (including women's groups and youth groups), private sector partners, donors and UN agencies.

Appendix 2: Situation and Gap Analysis for AJK, with Proposed Priority Actions

The Food Security and Nutrition Strategic Review is an independent, analytical and consultative exercise designed to identify the key challenges faced by Pakistan in achieving food security and improved nutrition, and to provide prioritized areas for action for the Government of Pakistan and all development partners. In an effort to make the review an inclusionary process and to better understand implementation efforts, the technical team from IFPRI and AKU held two consultative workshops in each province and region.

Facilitated by the AJK Planning and Development Department, the consultative workshops held in Muzaffarabad, AJK, were widely attended by members of government, local NGOs and United Nations officials. On December 20, 2016, the technical team also re-visited Muzaffarabad to present their conclusions to a similar stakeholder group.

In the first section of this appendix, we review the status of nutrition and food security in AJK, beginning with an assessment of the nutritional status of children and its immediate and underlying determinants. This approach follows the structure in Chapter 3 in the main report, but focuses on the specific context of AJK. The second section of this appendix presents gaps related to food security and nutrition, including gaps in food availability, food accessibility, WASH issues and policy, following the structure in Chapter 4. The third section of this appendix recommends a set of priority actions for AJK, which follows the structure in Chapters 4 and 5 of the main report.

A.2.1. Nutritional and Food Security Status in AJK

The main goal of this Strategic Review is to inform the government and stakeholders about the situation, gaps and recommendations related to improving nutrition and food security. The starting point is to assess nutritional status as reported in the UNICEF framework for children. We then look at the immediate determinants, including dietary intake and maternal health status. We broaden the review by looking at the underlying determinants of the nutritional status, including especially issues related to food insecurity.

A.2.1.1. Nutritional Status of Children

Table A.2-1 shows the main consequences for children associated with malnutrition and food insecurity, as reported in different data sources. Inadequate dietary intake and maternal health status among households in AJK translates into 32% of children being stunted, 26% underweight and 18% (highest across provinces and regions) wasted (NNS, 2011). In comparison with national averages for Pakistan, AJK performs better in terms of the percentage of children underweight and stunted. However, the prevalence of wasting is about 3% to 7% higher in AJK, depending upon the source of data used.

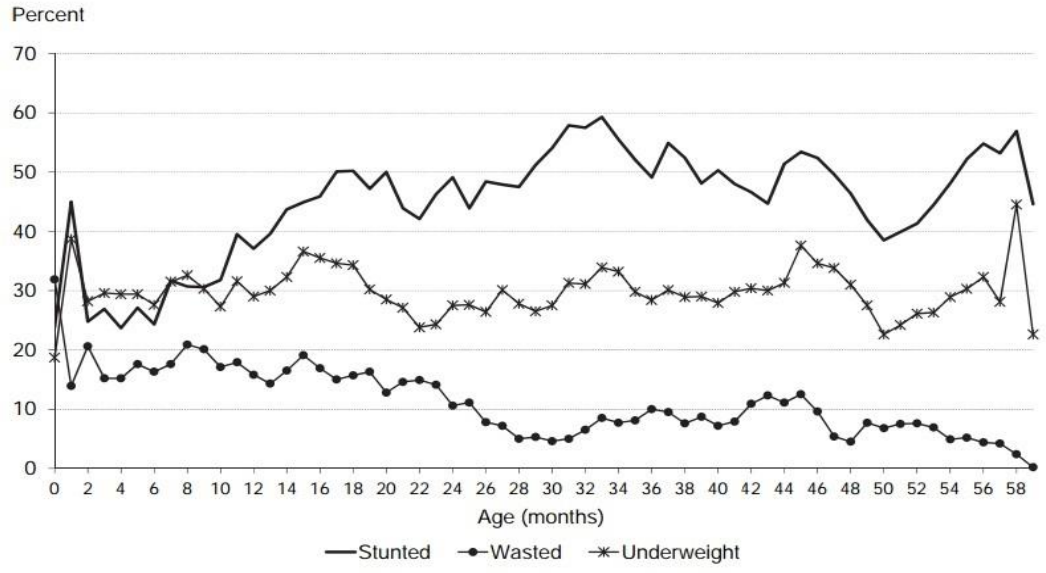
Table A.2-1: Anthropometrics/Mortality in Children Under Five in AJK

	AJK	Pakistan		
	NNS 2011	NNS 2001	NNS 2011	PDHS 2013
Underweight	26	41.5	32	30
Stunting	32	31	44	45
Wasting	18	12	15	11
Infant Mortality		-	*78	74
Under Five Mortality		-	*94	89

Note: * Data from PDHS 2007

The time path of stunting, wasting and underweight proportions is instructive to view to show challenges that arise when attempting to improve children's nutrition. The national situation derived from the PDHS 2013 shows that 26% of children are stunted *at birth*, more than 30% are wasted, and about 20% are underweight. Compromised maternal nutrition along with poor IYCF practices leads to increased children's malnourishment from 6 months until 23 months, so that 50% of children are stunted, while wasting declines to 10%. The underweight prevalence worsens to about 30% at two years of age, but stays around the same average afterwards. After two years, the increase in stunting still occurs, but at a much lower rate. See Figure A.2-1.

Figure A.2-1: National Nutrition Status of Children by Age, PDHS 2013



Additionally, severe micronutrient deficiencies exist among children, with zinc and vitamin A most prevalent among children under five. As shown in Table A.2-2, 44% of children in AJK are vitamin A deficient, 27% are iron deficient, 47% are zinc deficient and 35% are vitamin D deficient. Nevertheless, with the exception of zinc, AJK performs better than the national averages. Overall, just 36% of children aged 6-8 months were introduced to complementary foods in a timely manner, with only 7% meeting

their minimum dietary diversity requirement, 15% getting the MAD and 61% being fed the minimum number of times per day. Such malnourished children have higher risk of morbidity (both infectious and non-communicable diseases) and mortality. Moreover, these children have lower IQ and poor educational performance, physical growth and development (Victora and Rivera, 2014). Therefore, the role of nutrition, combined with proper IYCF practices, is crucially important.

Table A.2-2: Micronutrient Deficiencies in Children Under Five in AJK

	AJK		Pakistan	
	NNS 2011	NNS 2001	NNS 2011	PDHS 2013
Vitamin A	44	13	54	-
Iron	27	67	33	-
Zinc	47	37	39	-
Vitamin D	35	-	40	-

A.2.1.2. Immediate Determinants

The children's nutrition status presented above is affected by two immediate factors, including the mother's health status and the dietary intake within the family and by a child. These are discussed below.

Maternal Health Status. A mother's health status is an important determinant of children's health at birth and thereafter. Limited maternal nutrient reserves lead to intrauterine growth retardation, as 80% of an infant's iron and zinc stores are accumulated in the last trimester of pregnancy. Furthermore, compromised maternal nutrition affects the composition of breast milk, as many nutrients are secreted in human milk at the expense of maternal reserves, especially micronutrients such as vitamins B_6, B_{12}, A, and D. Specifically for children under the age of five, nutritional deficiencies can be attributable to poor IYCF practices within the region, with only 4% of children being exclusively breastfed and 38% being breastfed within the first hour of birth, a level much lower than considered optimal.

Widespread micronutrient deficiencies are found among pregnant and non-pregnant women across AJK (NNS, 2011), with vitamin D deficiency being the most prevalent among women. Table A.2-3 shows differences in micronutrient deficiency levels between non-pregnant and pregnant women in AJK, especially for vitamin A and iron. Vitamin A deficiency is more than twice as high in pregnant women (32% versus 14%) in AJK, but still is lower than the national averages. Iron deficiencies are also somewhat lower in AJK than in the country as a whole. These deficiencies can translate into growth problems in unborn children.

Table A.2-3: Maternal Micronutrient Deficiencies in AJK

Source	Vitamin A (Both Severe and Moderate)		Vitamin D		Iron		Zinc	
	Pregnant Women (%)	Non-Pregnant Women (%)	Pregnant Women (%)	Non-Pregnant Women (%)	Pregnant Women (%)	Non-Pregnant Women (%)	Pregnant Women (%)	Non-Pregnant Women (%)
Pakistan NNS-2001	-	6	-	-	-	45	-	46
Pakistan NNS-2011	46	42	69	67	25	19	48	41
AJK NNS-2011	32	14	73	-	23	18	-	-

Dietary Intake. The prevalence of undernourishment in AJK is well above the national average, at 29%. Overall, 55% of households in AJK have average food consumption lower than 2,350 kcals per adult equivalent per day, and 52% of households have borderline food consumption. In addition, 23% of households have low dietary diversity, leading to a high prevalence of food-based micronutrient deficiencies, including vitamin A (90%), iron (86%), zinc (82%) and protein (37%), as shown in Table A.2-4 (GoP, 2017).

Table A.2-4: Inadequacies in Caloric and Micronutrient Intake in AJK (GOP, 2017)

	Diet Quantity			Under-nutrition			
				% of HH with food-based micronutrient deficiencies			
	Average per capita kcal consumption	% of HH below 2350 kcal per adult equivalent per day	Prevalence of under-nourishment (PoU)	Protein	Vitamin-A	Iron	Zinc
Pakistan	2,360	44	18	32	77	68	40
AJ&K	2,204	55	29	37	90	86	82
Mirpur	2,225	54	29	37	86	79	70
Muzaffarabad	2,176	57	31	39	93	89	87
Rawalakot	2,206	54	27	36	92	91	88

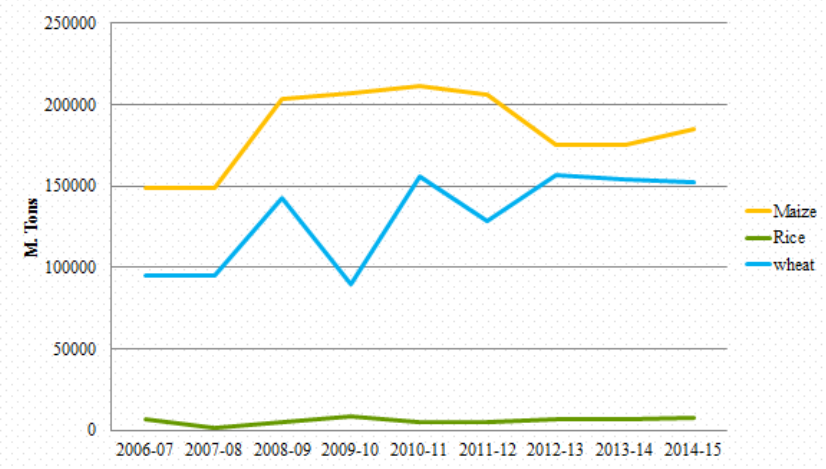
A.2.1.3. Underlying Determinants

In this section, important underlying determinants are reported, including availability and accessibility of food, WASH factors and the role of selected policies.

Food Availability. AJK is predominantly a net importer of food as the production of major crops, shown in Figure A.2-2, is insufficient to meet the demand of the local population. As seen, rice production has remained small, while there is much greater production and fluctuations in maize and wheat output from year to year. The production of livestock and poultry produce (milk, eggs, and meat) has performed better, with a significant increase in all three since 2006-07 (Figure A.2-3). While it is possible to rely solely on imports rather than domestic production, unlocking productivity in agriculture is essential to reduce the cost of a nutritious diet, especially in a region such as AJK where the potential for

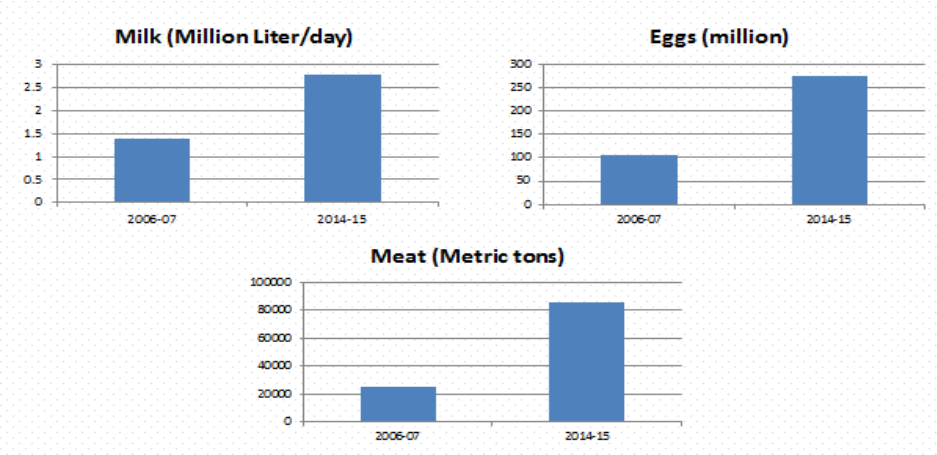
specialization into high value crops is high.

Figure A.2-2 Production of Major Crops in AJK



Source: AJK at a Glance (Various Issues)

Figure A.2-3: Livestock and Poultry Produce in AJK



Source: AJK at a Glance (Various Issues)

Food Accessibility. Though AJK has the lowest headcount of multidimensional poverty across Pakistan, one out of every five persons in the region is deprived in terms of access to health, education, and basic standards of living (GoP, 2016a). The variation in incidence of poverty is large across rural and urban areas, while the intensity of poverty is high throughout. Due to limited employment opportunities, AJK is plagued with a high unemployment rate. Out-migration is high, predominantly by male members of the household, to major cities across Pakistan as well as to countries abroad.

On the physical accessibility front, though AJK has made large improvements over the past five decades in terms of expansion of roads, transportation and communication networks, some areas in the northern region of AJK are still very remote with inadequate access to roads connected to major cities.

Village electrification has increased over the decades, yet the inconsistent supply of electricity remains an issue, especially in rural areas.

WASH Issues. WASH issues are closely related to food accessibility and nutrition. Access to improved (mostly covered) water sources and improved sanitation facilities has increased, yet one-fifth of households still do not have any type of toilet facility and open defecation is still widely practiced in rural areas (AJK-DHS, 2010). Availability of adequate infrastructure and sanitation facilities in schools is worse, as only 14% of schools have basic water, sanitation and infrastructure facilities, as compared to 93% in Punjab and 53% nationally (Alif Ailaan, 2016).

Policies. Because of the location of AJK in the mountainous region, and its role in the headwaters of the Indus rivers system, as well as the dependence on livestock as opposed to traditional crops, the policy requirements are different than in other regions. Because AJK must import wheat, the federal government has given AJK a subsidy for many years, which will be PKR 100 million during 2017. Policy-makers should determine whether this is the best use of funds. Climate change policies are also important for AJK, as changing weather patterns have the potential to force changes in livelihoods. From another perspective, the management of rangelands and forests in AJK can alter the sediment load that mainly affects downstream users of water and infrastructure. Thus there is a case to be made that AJK could obtain payments for rangeland improvements that lead to downstream benefits. The status of relevant AJK policies is summarized in Table A.2-5.

Table A.2-5: Policies in AJK

Policy	Year	Details
Forest policy	2013	Draft
Agriculture policy	2014	Draft
Health Policy	1996	Approved
Sanitation policy	2010	Approved
Education Policy	2016	Approved
Women Empowerment Policy	2014	Approved
Child Protection Policy	2005	Approved
Climate Change Policy	2017	Draft
AJK Food Authority Act	2017	Draft approved by cabinet
Home based worker policy	2017	Draft
Labor Policy	2017	Approved
Livestock Policy	2015	Draft
Multi Sectoral Nutrition Strategy (MSNS)	2017	Approved

A.2.2. Gaps Related to Food Security and Nutrition

The three days of regional consultations along with an in-depth desk review highlighted a series of gaps and challenges hindering progress in achieving food and nutrition security in AJK. These gaps are presented in three subsections below. The first subsection indicates gaps related to both nutrition and food security. The next subsections present gaps specific to food security, followed by nutrition.

A.2.2.1. Gaps Related to Both Food Security and Nutrition

Data Gaps. While there is a dearth of regular survey data related to food security and nutrition for all regions of Pakistan, this is especially true for AJK (as well as GB and FATA). Data pertaining to AJK for periodic household surveys such as the HIES and PSLM is not released alongside data for the four provinces, thus creating issues in data comparison and accessibility later on. Similarly, data on the AJK agriculture sector is not made available as comprehensively as it is for the provinces. Given the importance of adequate, timely and reliable data for evidence-based policy making, this lack of collection and publication of data is a major gap.

Policy and Governance Gaps. In addition to the forest and agricultural policies discussed above, most relevant policies in AJK are very recent or still in the draft stage, other than a wheat import policy, and need time to have impact. The Protection of Breastfeeding and Child Nutrition Ordinance was passed nationally in 2002, but has not been endorsed by AJK. In addition, the MSNS is now passed, but the integrated PC-1 is not in effect in AJK, and the SUN unit has just recently been launched and so is yet to be fully functional. Furthermore, legislation on salt iodization and food fortification are absent in the region, and a Food Fortification Alliance is yet to be developed.

Writing a policy does not ensure impact. For any policy to be successful, adequate funding is needed, as is a structure to mobilize, evaluate, and redirect funds. Additional challenges for policy implementation include the need for technical human resources and systems for M&E; making sure that diverse stakeholders are included; and securing investments from the private sector, though currently the private sector in AJK is very weak and makes a very limited contribution.

Accessibility Gaps. Aside from remoteness in the northern-most parts of AJK, a lack of affordability is possibly the biggest hindrance to food security in the region. Real incomes in the lowest quintile have risen at a much slower rate than in the highest quintiles, and the AJK unemployment rate of 14% is higher than the national average for Pakistan. A lack of employment opportunities, especially in rural AJK, and the resultant urban migration pose serious concerns for the already difficult food security situation. In the absence of affordability, social protection plays a key role. While many social protection programs[22] are underway in AJK, they clearly fall short, given the high headcount poverty in the region. Being highly prone to natural disasters, AJK faces an additional challenge of potential breakdown in physical accessibility of food in such cases. The lack of strategic food reserves for emergencies is another major gap to sustained food accessibility.

A.2.2.2. Gaps Specific to Food Security

Availability Gaps. Possibly the most critical issue in agriculture production in AJK is the nature of small land holdings, with almost 87% of the households having an average farm size of one to two acres. To further exacerbate the issue, historically little attention has been given to the development of the agricultural sector in the region. AJK currently lacks a dedicated institute to carry out agricultural research pertaining to the different agro-climatic zones in northern and southern AJK. In addition, the

[22] For this regional discussion, we do not address national social protection programs, such as the BISP, as the gaps and recommendations are similar across regions and have already been covered in the main report.

region lacks adequate agricultural inputs, such as fertilizer, and the small nature of farm holdings also makes mechanization uncommon. While the use of indigenous improved seed has been growing, it is costly, often unavailable, and inconsistent in quality. Inadequate water availability and underdeveloped irrigation channels (especially in the southern parts) is also another critical challenge, as the region lacks provisions for rainwater harvesting despite its high potential in northern AJK. Other issues that challenge agricultural production in AJK include climate change, marketing and distribution, and long-run sustainability. These issues are discussed in detail in Chapter 4 and do not vary significantly by province or region.

A.2.2.3 Gaps Specific to Nutrition

Absence of Nutrition-sensitive Schemes for WASH. A recent analysis found that only about one-quarter of stunting could be alleviated by nutrition-specific interventions alone, with an implication that the potential role of WASH is very high (Bhutta et al., 2013). AJK has made progress by drafting and approving a sanitation policy and has started a CLTS-based program to make all of AJK free of open defecation. In addition, AJK committed PKR 10 million for ODF initiatives in 2014-2015 and a program has been initiated in all 10 districts. Improving access to water has a range of benefits, including time and energy savings for women and children, and lower diarrhea prevalence (Cumming and Cairncross, 2016). Despite efforts towards improving WASH, only 57% of AJK's population has access to improved water sources, with women and girls being primarily responsible for fetching water in 78% of households. Water borne diseases cause 45% of children to miss days of school, and a sizable number of households do not treat drinking water due to lack of awareness. In addition, open defecation is practiced in 52% to 71% of schools, directly and adversely affecting the nutritional status. These factors contribute to school absenteeism and high drop-out rates, especially among girls during menstruation.[23] School drop-out rates among girls are associated with marriages and motherhood in adolescence, causing an intergenerational cycle of stunting and poverty. Creative solutions are needed for WASH investments that help nutrition.

Program Implementation Gaps. CMAM programs are confined to limited districts within AJK and have patchy coverage and no link with mainstream government programs or the health care system. In remote districts, the availability of human resources to deliver the program is an issue, and referral rates remain low. In addition, CMAM is cost-intensive when imports of RUTF are used, before local alternatives can be devised. Despite varying models of school health programs being implemented, little progress has been seen in health indicators or adoption of health seeking behaviors, so a successful and sustainable model with a nutrition package is yet to be developed. Among the districts of AJK, Muzaffarabad has the highest estimated number of severely underweight children. According to NNS 2011, we estimated that the district has around 25,000 severely underweight children, while the next two districts are Hattian Bala and Mirpur, each with about 12,500 severely underweight children. Together, these three districts include about 51% of the SAM-afflicted children in the region.

[23] http://documents.worldbank.org/curated/en/576391490881393712/pdf/113884-WP-PUBLIC-ADD-SERIES-Water-and-sanitation-program.pdf

In AJK, limited coverage by LHWs is a particular challenge due to the mountainous terrain, unstable political situation and sparse population. Furthermore, integration of LHW services with BHUs is uneven due to weak referral systems. Other issues include weak logistics and lack of separate adult and baby weighing scales. Moreover, process evaluations during programs and impact evaluation after programs are limited. Those programs that were evaluated did not effectively embed findings in scaling-up plans.

Lack of Awareness on Nutrition. Existing literature has consistently found that education and nutritional awareness among women plays a vital role in determining the dietary practices of households. Data for AJK from a plethora of nutrition-focused surveys confirms that nutrition indicators improve with increasing maternal educational levels, as well as wealth quintiles. At present, low literacy levels, media influences and pre-existing cultural beliefs/taboos (such as beliefs that fortification/polio vaccines cause impotency or that hot and cold food should be consumed for certain illnesses) adversely affect dietary practices. This problem is compounded by an absence of nutrition concepts in school curricula and teacher induction programs. During the consultations, participants expressed a common concern that most nutrition programs lack effective BCC strategies, contributing to low exclusive breastfeeding rates (4%) and high pre-lacteal feeding in the region. Community mobilization also is limited when designing nutrition interventions.

Human Resource Gaps. The improvement of nutrition in AJK requires that the health care system as well as the development sector have human resources with appropriate nutrition-related knowledge and skills. At present, there is limited capacity among existing health care providers in nutrition, and a dearth of nutrition experts in the development sector. One reason is that nutrition is not given enough emphasis in medical curricula, other academic programs or in-service training. Stakeholders raised concerns about the absence of performance appraisals, refresher trainings, supportive supervision and regular disbursement of salaries, which adversely affect motivation levels and lead to underperformance among health care workers. In addition, rapid turnover of management in nutrition programs, exemplified by the recent newly-appointed staff of the Integrated Reproductive, Maternal and Child Health (IRMNCH) program in AJK, was seen to hinder effective leadership.

A.2.3. Priority Actions for Food Security and Nutrition

This section presents recommended action items for improvements in food security and nutrition in AJK. The first subsection relates to national recommendations that require regional support. The next subsections present priority actions related to both food security and nutrition, followed by specific recommendations related to each topic separately.

A.2.3.1. National-level Recommendations that Need Regional Support

The following general and overarching actions, highlighted in the main report, should be part of all programs or policy developments, and should be supported and implemented by stakeholders in AJK:

- **Establish a nutrition and food security surveillance system**, in line with SDG targets and indicators, and ensure its data requirements are met. The NNS 2011, for example, missed nutritional data on

adolescents due to over-reporting, poor recording, high refusal rates, low bioavailability due to dietary practices and interrupted/inadequate supply of supplements.

- **Create of a culture of monitoring, evaluation and research** that helps define how to implement and scale up potentially valuable programs.
- **Identify and empower female champions for change** at the household and community levels in all programs and implementation structures, including microfinance for women and interventions that bring positive change for women in the household power structure.

Additionally, a set of analyses, policies, and programs appropriate to most provinces and regions are presented in chapter 5 and are summarized briefly here.

- **Evaluate current social protection programs** for potential coverage, costs and likely benefits, with nutrition sensitive components added whenever they can be effective. While universal social protection is perhaps a long-term goal, immediate challenges are to reach the urban poor and landless rural inhabitants. This review could examine if awareness programs within BISP, increasing payments, and graduation programs are effective to improve outcomes.
- **Finalize policies** under review at the national level **and implement them fully** through the regional government and other stakeholders. These include a National Water Policy, which has been drafted; a National Seed Amendment that was passed in 2015; and a Plant Breeder Rights Act in 2016. The implementation of these policies should be developed to the level of national policies.
- **Conduct comparative analysis of best approaches for BCC strategies** related to nutrition, particularly for breastfeeding campaigns, as current programs show little long-term effect. Analysis is needed of the value of broader nutrition campaigns and the potential use of community social structures for promoting nutrition knowledge. BCC strategies also should include mechanisms to sensitize males on women's health issues.
- **Review the role of primary and secondary healthcare facilities and other locations for SNF delivery** (particularly since SNF programs are not a top option economically – (Shekar et al., 2016)); assess the feasibility of integrating CMAM programs into the community-based health care delivery system; and enhance capacity of LHWs and primary and secondary care doctors to screen for acute malnutrition.
- Assess the potential for schools to **add basic nutrition education and WASH concepts in teacher training programs,** and assess the expected nutritional impact of improving WASH facilities in schools, primary healthcare units and other locations to identify those that are most cost-effective and have the highest impact on nutrition outcomes.

A.2.3.2. Priority Actions Related to Both Food Security and Nutrition

In this section, we offer recommendations specific to AJK and related to both food security and nutrition.

Adopt and Implement Relevant Policies. AJK needs to adopt and implement a series of policies in the areas of food security and nutrition. AJK recently approved MSNS; now cells must be created and integrated PC-1s must be put in place for funding. The related cells should be housed in the P&D department, and they should have the mandate to review projects for gender-sensitive as well as

nutrition-sensitive components. The departments related to food security have more of their mandate outside the MSNS, so an assessment should be conducted after several years about whether this structure is adequate to address food security.

Explore Funding Options. The general funding situation is difficult in AJK for a number of reasons. Since AJK is not a province, it does not get a National Finance Commission (NFC) award. As most inhabitants are rural, the tax base is small, and given the likelihood of expensive disaster relief needed at times, extra funds for development purposes are not readily available. Taxes on tourism and transport may be the best options in the short term to raise funds. The wheat subsidies and distribution system may be the most reliable support for unreached groups in AJK currently, but this issue should be evaluated.

A.2.3.3. Priority Actions Specific to Food Security

This section presents action items specifically for improving food security in AJK.

Increase Productivity. The agricultural sector is not a large part of the economy in AJK, since farms are small and tend to be based on livestock and oriented towards self-sufficiency. One option is to raise the productivity of dairy and meat animals, perhaps with the development of cooperative marketing and distribution functions. The same kind of development could be done for fruit production. The AJK government should also explore the possibility of bringing in the private sector to do the same functions.

Fund Agricultural Research. AJK needs to find a way to fund agricultural research that is adapted to the region. The research program should include nonagricultural science activities (beyond biology, plant science and animal breeding etc.) and should reach out beyond the public sector research institutions and universities. One suggestion is to build joint research programs with other mountainous areas. Another idea is to specialize in certain types of crops and livestock that can be expanded in the region.

Invest in Forests and Rangelands. It is very important to invest in forests (on government, private and common lands) and rangelands in order to improve the region's productivity and rehabilitate a key natural resource. The rangelands are a huge resource and, if managed correctly, have the possibility to increase the region's economic growth, add to sustainability, productivity and food accessibility for poor and unreached populations. The community engagement in the development and management of these valuable resources needs to be tracked and supported.

Explore Other Suggestions. Many additional ideas were proposed during the consultations, including: Index-based crop and livestock insurance schemes; ICT-based mapping and zoning of agriculture; cluster-based approaches to agriculture; interest-free credit facilities; improved livestock vaccination systems through cold boxes; milk collection centers; and developing better genetic potential of indigenous livestock.

Replicate Gender Success Stories. In AJK, the positive experiences of the Integrated Land Management Programme (ILM) and Creating Assets for Rural Women (CARW) can be replicated. In addition, women's literacy rate in AJK is relatively higher than elsewhere in the country, so strategies to address their employment and entrepreneurial needs should take this positive factor into account.

Capitalize on Marketing Opportunities. The partnership among universities, the private sector and the government for the development and marketing of medicinal and aromatic plants could play a crucial role in improving marketing opportunities. Assessments of the valleys like Swat could contribute to other improvements, such as enhancing the roles of traditional and small-scale processors; creating incentives to diversify; identifying innovative ways to improve food fortification and food safety regulation; facilitation of kitchen gardening and small-scale vegetable farming; and food handling training for farmers, especially women. While there are numerous options, one potential approach is to create an Agricultural Marketing Regulatory Authority to shift the government to a more regulatory role for agricultural marketing, and to encourage more engagement from the private sector, as is being attempted in Punjab.

A.2.3.4. Priority Actions Specific to Nutrition

Adopt and Enforce Relevant Policies. Recommended actions specific to nutrition in AJK include adoption and enforcement of the following key policies to track, review and promote nutrition outcomes:

- *Protection of Breastfeeding and Child Nutrition Act.* This ordinance was passed federally in 2002, and is yet to be endorsed by AJK.
- *Salt iodization Acts***.** AJK lags behind, with no legislation enacted on salt iodization.
- *Food Fortification Acts***.** Mostly donor-related efforts have been made for food fortification, particularly wheat flour, through GAIN and MI. Fortification of oil has been made mandatory through the Pure Food Rules of 1965. Enactment of legislation is needed for both fortified oil and wheat flour, with mechanisms to empower quality assurance by food processors and encourage reduction in cost.
- *Early Marriage Restraint Act***.** AJK has not passed the Early Marriage Restraint Act to prohibit marriage before the age of 18. Passage and strict enforcement of this law will help ensure delays in marriage, thereby reducing the number of adolescent mothers entering the intergenerational cycle of stunting and poverty.

Improve Program Implementation. Research should inform the design of nutrition programs that are context appropriate, gain community acceptance, and meet actual community-level needs. Also needed are process evaluations and M&E systems with periodic cross-cutting reviews of funds, as well as measurable indicators and time-bound goals to create accountability. These systems will help establish feasibility and identify bottlenecks for full-scale implementation. Strengthening departmental MIS and R&D functions also is essential. A web-based knowledge management portal for nutrition should be considered, with all information made accessible to promote lessons learnt, identify best practices, and avoid duplication of efforts.

A CMAM program aimed at eliminating severe malnutrition in the three most afflicted AJK districts (Muzaffarabad, Hattian Bala and Mirpur) using the full range of CMAM interventions (estimated to cost PKR 39,600 per person(UNICEF, 2012)) would cost a total of PKR 2 billion. If the next two districts with the highest number of severely underweight children (Bhimber and Kotli) are included, the cost goes up

to PKR 2.7 billion. Covering severely underweight children in all districts of AJK would cost PKR 3.9 billion[24]. These costs are fairly high compared to the wheat subsidy of PKR 100 million. Ultimately, these costs could drop by using a lifecycle approach to nutrition, progressively seeing adolescents as the first point of intervention, followed by pregnant and lactating women to stop the intergenerational transmission of poor growth and development in children. CMAM programs with built-in compliance monitoring at schools can be very effective. Furthermore, horizontal integration of such programs, supported by community mobilization, could help ensure that marginalized segments of the population are reached. The MSNS can pave the way to link these programs with school monitoring. In general, limited resources in AJK should be allocated on the basis of data related to child welfare and vulnerability.

The LHW program is a potential resource for identifying those at risk and integrating CMAM programs into the health care system. Enhancing the capacity of frontline health workers (LHWs CHWs, LHVs and Medical Officers at BHU/RHC) for screening for acute malnutrition, counseling parents and dispensing SNF can increase coverage and ensure effective treatment of SAM and MAM on an out-patient basis.

Develop Human Resources. We recommend creation of dedicated nutrition positions in programs and hiring of qualified nutrition experts. To achieve these goals requires long-term human resource development initiatives. First, curricular standards and requisites on nutrition competencies need to be established and made a mandatory part of medical education and training as well as for other academic courses. Second, evaluations of existing nutrition-related community programs suggest a need for developing training curriculum and conducting in-service refresher trainings. These suggestions should be extended to training teachers and cadres of the school health and nutrition supervisors. Third, development of transparent and robust performance evaluation systems with key performance indicators in the school-based and general health care systems is essential to improve individual performances and consequently organizational performance.

Increase Awareness on Nutrition. To help ensure messages reach all segments of the population, we recommend dissemination of nutrition messages through various media, including cooking shows. Message dissemination should be supplemented by hands-on counseling by trained health care workers on key topics such as recommended IYCF practices, low-cost high-nutritional value meal planning, complementary proteins, portion sizes, and carbohydrate counting.

[24] In fact, since 2013 AJK has developed CMAM interventions in five districts (Neelum, Hattian, Muzaffarabad, Bagh and Haveli) which are not identical to those with the most severe CMAM problems from NNS, 2011.

Appendix 3: Situation and Gap Analysis for Balochistan, with Proposed Priority Actions

The Food Security and Nutrition Strategic Review is an independent, analytical and consultative exercise designed to identify the key challenges faced by Pakistan in achieving food security and improved nutrition, and to provide prioritized areas for action for the Government of Pakistan and all development partners. In an effort to make the review an inclusionary process and to better understand implementation efforts, the technical team from IFPRI and AKU held two consultative workshops in each province and region.

Facilitated by the Balochistan Planning and Development Department, the consultative workshops held in Quetta, Balochistan, were widely attended by members of government, local NGOs and United Nations officials. On January 11, 2017, the technical team also re-visited Quetta to present their conclusions to a similar stakeholder group.

In the first section of this appendix, we review the status of nutrition and food security in Balochistan, beginning with an assessment of the nutritional status of children and its immediate and underlying determinants. This approach follows the structure in Chapter 3 in the main report, but focuses on the specific context of Balochistan. The second section of this appendix presents gaps related to food security and nutrition, including gaps in food availability, food accessibility, WASH issues and policy, following the structure in Chapter 4. The third section of this appendix recommends a set of priority actions for Balochistan, which follows the structure in Chapters 4 and 5 of the main report.

A.3.1. Nutritional and Food Security Status in Balochistan

The main goal of this Strategic Review is to inform the government and stakeholders about the situation, gaps and recommendations related to improving nutrition and food security. The starting point is to assess nutritional status as reported in the UNICEF framework for children. We then look at the immediate determinants, including dietary intake and maternal health status. We broaden the review by looking at the underlying determinants of the nutritional status, including especially issues related to food insecurity.

A.3.1.1. Nutritional Status of Children

Table A.3-1 shows the main consequences for children derived from malnutrition, as reported in different data sources. Inadequate dietary intake and maternal health status among households in Balochistan translates into 52% of children being stunted, 40% underweight and 16% wasted (NNS, 2011). Balochistan lags behind the rest of the country across all measures of nutrition, with more than half the children being stunted. The level of stunting is about 8% higher than the overall Pakistan value, when comparing the two NNS 2011 values, and wasting is about the same. Remarkably, though, the IMR and under five mortality are lower than the national average.

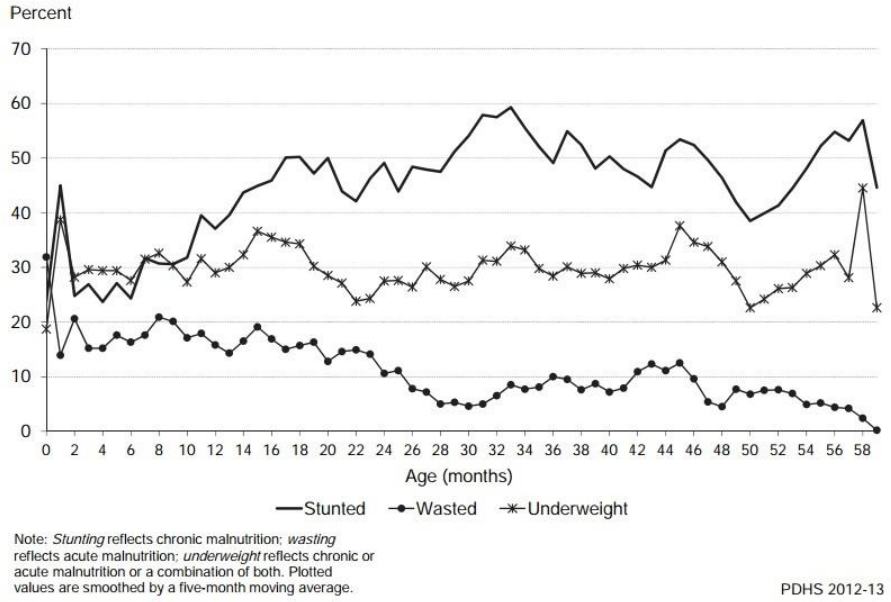
Table A.3-1: Anthropometrics/Mortality in Children Under Five in Balochistan

	Balochistan		Pakistan	
	NNS 2011	NNS 2001	NNS 2011	PDHS 2013
Underweight	40	41.5	32	30
Stunting	52	31	44	45
Wasting	16	12	15	11
Infant Mortality	49	-	*78	74
Under Five Mortality	59	-	*94	89

Note: * Data from PDHS 2007

The time path of stunting, wasting and underweight proportions is instructive to view to show challenges that arise when attempting to improve children's nutrition. The national situation derived from the PDHS 2013 shows that 26% of children are stunted *at birth*, more than 30% are wasted, and about 20% are underweight. Compromised maternal nutrition along with poor IYCF practices leads to increased children's malnourishment from 6 months until 23 months, so that 50% of children are stunted, while wasting declines to 10%. The underweight prevalence worsens to about 30% at two years of age, but stays around the same average afterwards. After two years, the increase in stunting still occurs, but at a much lower rate. See Figure A.3-1.

Figure A.3-1: Nutrition Status of Children by Age, PDHS 2013



Additionally, severe micronutrient deficiencies exist among children, with vitamin A most prevalent among children under five. As shown in Table A.3-2, 74% children in Balochistan are vitamin A deficient, 33% are iron deficient, 40% are zinc deficient and 43% are vitamin D deficient. Balochistan performs equal to the national average for iron. In the absence of adequate dietary practices, micronutrients

requirements must be met with supplements. The PDHS 2013 notes that only 1.7% children aged 6-59 months received iron supplements in the last 7 days. Vitamin A supplementation was better, as 45.3% of children received a dose within 6 months. Such malnourished children have higher risk of morbidity (both infectious and non-communicable diseases) and mortality. Moreover, these children have lower IQ and poor educational performance, physical growth and development (Victora and Rivera, 2014). Therefore, the role of nutrition, combined with proper IYCF practices, is crucially important.

Table A.3-2. Micronutrient Deficiencies in Children Under Five in Balochistan

	Balochistan		Pakistan	
	NNS 2011	NNS 2001	NNS 2011	PDHS 2013
Vitamin A	74	13	54	-
Iron	33	67	33	-
Zinc	40	37	39	-
Vitamin D	43	-	40	-

A.3.1.2. Immediate Determinants

The children's nutrition status presented above is affected by two immediate factors, including the mother's health status and the dietary intake within the family and by a child. These are discussed below.

Maternal Health Status. A mother's health status is an important determinant of children's health at birth and thereafter. Limited maternal nutrient reserves lead to intrauterine growth retardation, as 80% of an infant's iron and zinc stores are accumulated in the last trimester of pregnancy. Furthermore, compromised maternal nutrition affects the composition of breast milk, as many nutrients are secreted in human milk at the expense of maternal reserves, especially micronutrients such as vitamins B_6, B_{12}, A, and D. Specifically for children under the age of five, nutritional deficiencies can be attributable to poor IYCF practices within the region, with only 27% of children being exclusively breastfed and 63% being breastfed within the first hour of birth, a level much lower than considered optimal.

Widespread micronutrient deficiencies are found among pregnant and non-pregnant women across Balochistan (NNS, 2011). Table A.3-3 shows differences in micronutrient deficiency levels between non-pregnant and pregnant women, especially for iron and vitamin A. Iron deficiency is more than twice as high in pregnant women (55% versus 22%). These deficiencies can translate into growth problems in unborn children. Also relevant to maternal health status is that anthropometric measures from the PDHS 2013 shows that 35.1% of women in Balochistan are overweight or obese, while 9% are underweight(PDHS, 2013).

Table A.3-3: Maternal Micronutrient Deficiencies in Balochistan

Province	Vitamin A (Both Severe and Moderate)		Vitamin D		Iron		Zinc	
	Pregnant Women (%)	Non-Pregnant Women (%)	Pregnant Women (%)	Non-Pregnant Women (%)	Pregnant Women (%)	Non-Pregnant Women (%)	Pregnant Women (%)	Non-Pregnant Women (%)
Pakistan NNS - 2001	-	6	-	-	-	45	-	46
Pakistan NNS-2011	46	42	69	67	25	19	48	41
Balochistan NNS-2011	61	55	37	44	55	22	44	44

Dietary Intake. The prevalence of undernourishment in Balochistan is well above the national average, at 40%. Overall, 63% of households in Balochistan have average food consumption lower than 2,350 kcals per adult equivalent per day. In addition, the population in Balochistan has limited dietary diversity, so 83.4% of households are below the staple adjusted nutrient threshold (GoP and WFP, 2016a; GoP,2017). Moreover, data show a high proportion of total food expenditure goes to wheat, oil, fats and sugar, which are energy dense but of low nutritional value, which makes the lack of dietary diversity more problematic. Resultant food-based micronutrient deficiencies include vitamin A (89%), iron (86%), zinc (65%) and protein (54%), as shown in Table A.3-4 (GoP, 2017).

Table A.3-4: Inadequacies in Caloric and Micronutrient Intake in Balochistan (GOP, 2017)

	Diet Quantity			Under-nutrition			
	Average Per capita kcal consumption	% of HH below 2350 kcal per adult equivalent per day	Prevalence of under-nourishment (PoU)	% of HH with food based micro-nutrient deficiencies			
				Protein	Vitamin-A	Iron	Zinc
Pakistan	2,360	44	18	32	77	68	40
Balochistan	2,064	63	40	54	89	86	65
Kalat	2,019	68	48	62	90	86	69
Mekran	1,826	77	70	46	100	72	72
Nasirabad	2,079	63	41	56	86	85	75
Quetta	2,149	53	34	55	87	93	58
Sibi	2,087	68	43	61	82	82	82
Zhob	2,143	53	28	40	91	85	45

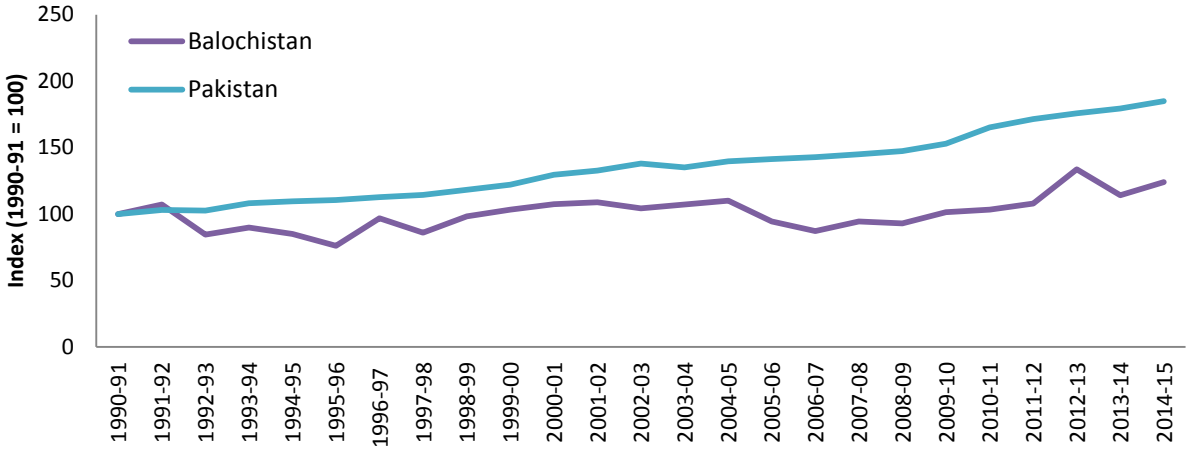
A.3.1.2. Underlying Determinants

In this section, important underlying determinants are reported, including availability and accessibility of food, WASH factors and the role of selected policies.

Food Availability. During the last 25 years in Balochistan, crop yields per acre of land had to increase by 24% to maintain the same per capita food availability over time (GoP, 2014b), as Figure A.3-2 shows.

(Nationally, the production from each acre of land needed to increase by an average of 85% to support the added population during the same period.) However, Table A.3-5 shows that no crop yields kept up with provincial population growth, and in fact the production of vegetables and fruit declined, While it is possible to rely on imports rather than domestic production, unlocking productivity in agriculture is essential to reduce the cost of a nutritious diet and permit scarce government revenues, currently used for subsidies, to be shifted to higher payoff uses.

Figure A.3-2: Population Pressure on Cultivated Land Area in Balochistan



Source: Agriculture Statistics of Pakistan (Various Issues) and Population Estimates from Population Census, 1998.

Table A.3-5: Crop Yield and Population Growth Rates in Balochistan

	Wheat	Rice	Maize	Sugarcane	Pulses	Vegetables	Fruits	Population
Balochistan	1.3	0.1	0.8	1.2	0.7	-0.1	-1.4	2.4
Pakistan	1.6	1.0	3.6	1.0	0.6	0.9	0.1	2.4

Source: Agriculture Statistics (Various Issues) and Economic Survey of Pakistan, 2013-14
Note: The 34-year population and crop yields growth rate from 1981 to 2014 is sourced from Economic Survey of Pakistan, 2015-16 and Agriculture Statistics of Pakistan (Various Issues)

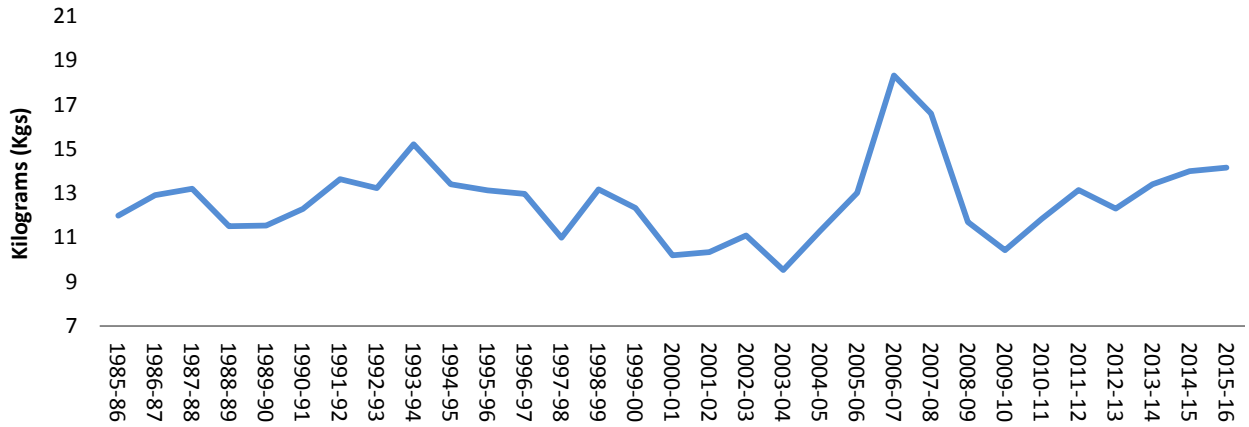
Food Accessibility. With the exception of FATA, Balochistan has the highest rate of headcount multidimensional poverty at 71%, and rural poverty at almost 85%. In addition, out of the eleven districts throughout Pakistan where poverty has increased since 2004, six[25] are in Balochistan (GoP, 2016a). At 83%, Balochistan also has the highest number of households that are unable to afford a balanced (staple adjusted) nutritious diet given their current levels of food expenditures. The cost of such a diet is also highest in Balochistan as compared to other provinces (GoP and WFP, 2016a).

Nominal daily wages of unskilled labor in urban Balochistan have more than tripled between 2004-05 and 2015-16. However, there are large fluctuations in affordability due to the year-to-year food price volatility. Figure A.3-3 shows that an unskilled laborer in Quetta could afford around 18 kg of wheat with

[25] Chargai, Pishin, Ziarat, Killa Abdullah, Panjgur and Harnai

his/her daily wage in 2006-07, but could only afford about 10 kg three years later in 2009-10 (GoP, 2016b). In more recent years wheat affordability is improving.

Figure A.3-3: Kilograms of Wheat Flour Affordable per One Day's Wages in Quetta



Source: Economic Survey of Pakistan (Various Issues)

On the physical accessibility front, Balochistan has made significant improvements over the past five decades in terms of expansion of roads, transportation and communication networks. However, many areas of the province are remote, and for almost 85% of the population it still takes more than three hours to reach a major city (Kedir, Schmidt, and Waqas, 2016), in part because the rate of urbanization in Balochistan is 0.9%, (though this rate is much lower than the national average of 3.6%). Village electrification has increased, yet the inconsistent supply of electricity remains an issue, especially in rural areas.

WASH Issues. WASH issues are closely related to food accessibility and nutrition. Access to improved (mostly covered) water sources and improved sanitation facilities has increased, but only 30% of households have flush toilet facility and open defecation is still widely practiced (PSLM, 2014-15). Availability of adequate infrastructure and sanitation facilities in schools is poor, as only 26% of schools have basic water, sanitation and infrastructure facilities, compared to 93% in Punjab and 53% nationally (Alif Ailaan, 2016).

Policies. Significant steps have been taken in drafting nutrition-support and food security policies in Balochistan, particularly since the 2010 floods and the federal establishment of the PINS. The status of several relevant policies is noted in Table A.3-6. In addition, the draft of the Balochistan Sanitation Policy awaits approval, and initial discussions have begun on the Balochistan Agriculture Policy.

Table A.3-6: Policies in Balochistan

	Policy	Year	Details
1.	Protection of Breastfeeding and Child Nutrition Act	2014	Endorsed by Balochistan
2.	Balochistan Integrated Water Management Policy	2005	Integrated into projects, e.g. Balochistan Integrated Water Resources Management and Development Project
3.	Balochistan Food Authority Act	2014	Established a Food Authority, notified in 2016, to operate under the Food Department
4.	Multi-sectoral Nutrition Strategies and PC-1s	2015	Drafted within the scope of Pakistan Vision 2025

A.3.2. Gaps in Food Security and Nutrition

The three days of provincial consultations along with an in-depth desk review highlighted a series of gaps and challenges hindering progress in achieving food and nutrition security in Balochistan. These gaps are presented in three subsections below. The first subsection indicates gaps related to both nutrition and food security. The next subsections present gaps specific to food security, followed by nutrition.

A.3.2.1. Gaps Related to Both Food Security and Nutrition

Policy and Governance Gaps. Most relevant policies in Balochistan are very recent and need time to have impact. The Protection of Breastfeeding and Child Nutrition Ordinance was passed nationally in 2002, but only adopted 12 years later in Balochistan (in 2014), followed by the notification of the Infant Feeding Board. Despite these efforts, exclusive breastfeeding rates remain low, while early initiation of breastfeeding has declined. A salt iodization policy still sits in draft form, pending approval from the Food Department. Food fortification is limited to fortification of oil with vitamins A and D under the Pure Food Rules, and wheat flour fortification and salt iodization efforts from donors such as GAIN and MI.

Writing a policy does not ensure impact. For any policy to be successful, adequate funding is needed, as is a structure to mobilize, evaluate, and redirect funds. Additional challenges for policy implementation include the need for technical human resources and systems for monitoring and evaluation; making sure that diverse stakeholders are included; and securing investments from the private sector.

Funding Gaps. Stakeholders in Balochistan consultation meetings raised as a major concern the limited funding from government and reliance on donors for nutrition-specific and nutrition-sensitive programs. Other concerns regarding funding modalities included the population-based distribution formula, which led to inequitable funding allocations, depriving districts most in need. In addition, a large subsidy, estimated at PKR 26 billion, is being provided on electricity on agricultural tube wells, the unchecked use of which could deplete the water table. The Federal Ministry of Finance tried to cut back this subsidy in 2017, but was rebuffed by the alignment of vested interests.

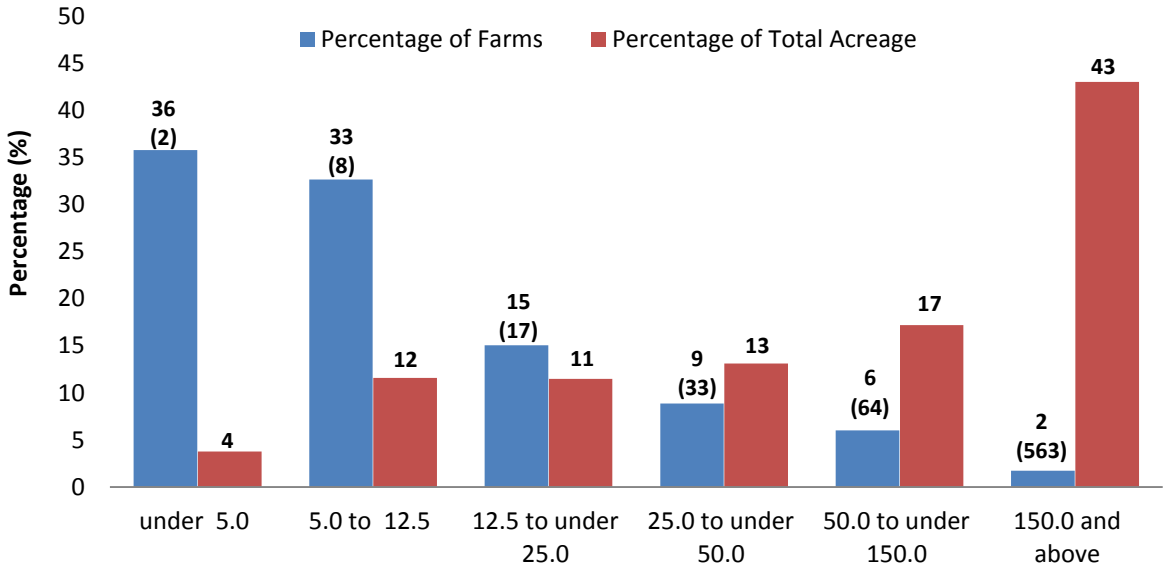
Accessibility Gaps. A lack of affordability is possibly the biggest hindrance to food security and nutrition in Balochistan. Real incomes in the lowest quintile have risen at a much slower rate than incomes in the highest quintiles, so a balanced diet remains out of reach for 84% of rural households, given their current food expenditures. Any economic growth in Balochistan up until now has not been inclusive or

equitable. As in most of rural Pakistan, a lack of rural non-farm employment opportunities in the province, and the resultant urban migration, poses a serious concern for the already difficult food security situation. In the absence of affordability, social protection plays a key role. While many social protection programs[26] are underway in Balochistan, they clearly fall short, given that Balochistan continues to have the highest rates of poverty across the country.

A.3.2.2. Gaps Specific to Food Security

Availability Gaps. One of the most critical issues in food availability in Balochistan is limited water resources for agriculture. The lack of attention towards rainwater harvesting remains a gap, along with inefficient irrigation practices. The growing number of small farms with less than five acres of land is another challenge for agriculture in Balochistan. Figure A.3-4 shows the percentage of farms and total acreage of different farm sizes. More than 35% of farms are less than 5 acres in size, but they only command 4% of the total acreage while large farmers command 60% of the total acreage. Most of this acreage is coming from fragmentation of mid-sized farms, which fall in the small commercial farmer category. This fragmentation is a concern because small commercial farmers have a significant role in productivity growth and poverty reduction. (See Chapter 4 for a detailed discussion on work by Mellor and Malik, 2017.)

Figure A.3-4: Farm Size in Balochistan, in Acres



Source: Agriculture Census (Various Issues)
Note: Numbers in parentheses show average farm size

For sustained agricultural production, traditional inputs cannot be the engines of growth, as land, tube wells, water, and even fertilizer and tractors have reached their maximum contribution. While the use of indigenous improved seed has been growing, it is costly, often unavailable, and inconsistent in quality.

[26] For this provincial discussion, we do not address national social protection programs, such as the BISP, as the gaps and recommendations are similar across provinces and have already been covered in the main report.

With the growing number of small farms and input use saturation, advancements in agricultural R&D are crucial, but spending on R&D remains low in Balochistan, as in the rest of the country. Simultaneously, province lacks investment as well as R&D from the private sector. Other issues that challenge agricultural production in Balochistan include lack of efficient irrigation system, lack of effective extension services, climate change, marketing and distribution, and long-run sustainability. These issues are discussed in detail in Chapter 4 and do not vary significantly by province.

A.3.2.3. Gaps Specific to Nutrition

Absence of Nutrition-sensitive Schemes for WASH. A recent analysis suggests that only about one-quarter of stunting could be alleviated by nutrition-specific interventions alone, which indicates that the potential role of WASH might be significant (Bhutta et al., 2013). Balochistan has made good progress in improving travel time to water sources, as 94% of families now travel less than 30 minutes to reach a water source. This improvement has a range of potential benefits, including time and energy savings for women and children, and lower diarrhea prevalence (Cumming and Cairncross, 2016). However, only 70% of households procure drinking water from an improved (mostly covered) water source, as compared to 90% nationally (PSLM, 2014-15). Moreover, the majority of households (89%) do not treat water, and poor water quality is particularly an issue in urban areas (PDHS, 2013). In addition, less than half of households (46%) have access to adequate sanitation facilities. Open defecation as well as sub-optimal WASH conditions in schools is still common, adversely affecting the nutritional status of children. These factors contribute to school absenteeism and high drop-out rates, especially among girls during menstruation.[27] School drop-out rates among girls are associated with early marriages and motherhood in adolescence, thus initiating an intergenerational cycle of stunting and poverty. Creative solutions are needed for WASH investments that help nutrition.

Program Implementation Gaps. CMAM programs are confined to limited districts within Balochistan and have patchy coverage and no link with mainstream government programs or the health care system. In remote districts, the availability of human resources to deliver the program is an issue, and referral rates remain low. In addition, CMAM is cost-intensive when imports of RUTF are used, before local alternatives are devised. Despite varying models of school health programs being implemented, little progress has been seen in health indicators or adoption of health seeking behaviors, so a successful and sustainable model with a nutrition package is yet to be developed. Among the districts of Balochistan, Kalat has the highest estimated number of severely underweight children. We estimate that Kalat has around 38,000 severely underweight children, while the next two districts are Awaran and Jaffarabad, each with about 29,000 severely underweight children. Together, these three districts include about 37% of the SAM-afflicted children, so this form of malnutrition is more dispersed in Balochistan than in other provinces.

Integration of LHW services with BHUs is uneven due to weak referral systems. Other issues included weak logistics and a lack of separate adult and baby weighing scales. Moreover, process evaluations

[27] http://documents.worldbank.org/curated/en/576391490881393712/pdf/113884-WP-PUBLIC-ADD-SERIES-Water-and-sanitation-program.pdf

during programs and impact evaluation after programs are limited. Those programs that were evaluated did not effectively embed findings in scaling-up plans.

Lack of Awareness on Nutrition. The literature consistently suggests that education and nutritional awareness among women plays a vital role in determining the dietary practices of households. Data from a plethora of nutrition-focused surveys confirms that nutrition indicators improve with increasing maternal educational levels, as well as wealth quintiles. Low literacy levels coupled with media influences and cultural beliefs/taboos (such as beliefs that fortification/polio vaccines cause impotency, or that hot and cold foods should be consumed for certain illnesses) adversely affect dietary practices. The situation is amplified by an absence of nutrition concepts in school curricula and teacher induction programs. During the consultations, participants expressed a common concern that most nutrition programs lack effective BCC strategies, contributing to low exclusive breastfeeding rates (27%) and high pre-lacteal feeding in the province. Community mobilization also is limited when designing nutrition interventions.

Human Resource Gaps. To achieve improved nutrition in Balochistan, the health care system as well as the development sector should have human resources with credible nutrition expertise. At present, there is limited capacity among existing health care providers in nutrition, and a dearth of nutrition experts in the development sector. One reason is that nutrition is not given enough emphasis in medical curricula and in-service training. Stakeholders pointed out that performance appraisals, refresher trainings and supportive supervision are lacking. These problems are exacerbated by irregular disbursement of salaries, which adversely affects motivation levels and leads to underperformance among health care workers. In addition, stakeholders noted that rapid turnover of management in nutrition programs hinders effective leadership.

A.3.3. Priority Actions for Food Security and Nutrition

This section presents recommended action items for improvements in food security and nutrition in Balochistan. The first subsection relates to national recommendations that require provincial support. The next subsections present priority actions related to both food security and nutrition, followed by specific recommendations related to each topic separately.

A.3.3.1. National-level Recommendations that Need Provincial Support

The following general and overarching actions, highlighted in the main report, should be part of all programs or policy developments, and should be supported and implemented by stakeholders in Balochistan:

- **Establish a nutrition and food security surveillance system**, in line with SDG targets and indicators, and ensure its data requirements are met. The NNS 2011, for example, missed nutritional data on adolescents due to over-reporting, poor recording, high refusal rates, low bioavailability due to dietary practices and interrupted/inadequate supply of supplements.
- **Create of a culture of monitoring, evaluation and research** that helps define how to implement and scale up potentially valuable programs.

- **Identify and empower female champions for change** at the household and community levels in all programs and implementation structures, including microfinance for women and interventions that bring positive change for women in the household power structure.

Additionally, a set of analyses, policies, and programs appropriate to most provinces and regions are presented in Chapter 5 and are summarized briefly here.

- **Evaluate current social protection programs** for potential coverage, costs and likely benefits, with nutrition sensitive components added whenever they can be effective. While universal social protection is perhaps a long-term goal, immediate challenges are to reach the urban poor and landless rural inhabitants. This review could examine if awareness programs within BISP, increasing payments, and graduation programs are effective to improve outcomes.
- **Finalize policies** under review at the national level **and implement them fully** through the provincial government and other stakeholders. These include a National Water Policy, which has been drafted; a National Seed Amendment that was passed in 2015; and a Plant Breeder Rights Act in 2016. The implementation of these policies has been slow.
- **Conduct comparative analysis of best approaches for BCC strategies** related to nutrition, particularly for breastfeeding campaigns, as current programs show little long-term effect. Analysis is needed of the value of broader nutrition campaigns and the potential use of community social structures for promoting nutrition knowledge. BCC strategies also should include mechanisms to sensitize males on women's health issues.
- **Review the role of BHUs and other locations for SNF delivery** (particularly since SNF programs are not a top option economically – (Shekar et al., 2016)); assess the feasibility of integrating CMAM programs into the community-based health care delivery system; and enhance capacity of LHWs and BHU doctors to screen for acute malnutrition.
- Assess the potential for schools to **add basic nutrition education and WASH concepts in teacher training programs,** and assess the expected nutritional impact of improving WASH facilities in schools and other locations to identify those that are most cost-effective and have the highest impact on nutrition outcomes.

A.3.3.2. Priority Actions Related to Both Food Security and Nutrition

In this section, we offer recommendations related to both food security and nutrition in Balochistan.

Further Improve Institutional Arrangements. The MSNS and associated institutional structures have been developed well in Balochistan, with the strategy completed, cells created and integrated PC-1s put in place for funding. However, as these systems are new, they must be given time to bear results, and all interested stakeholders should observe and track this progress. Specific suggestions include the following:

- **Review proposed projects for gender-sensitive and nutrition-sensitive components**. The related nutrition cell in the provincial P&D department can take the lead. Conducting such

reviews for all proposed projects would improve the gender and nutrition dimensions of projects implemented by all related departments.

- **Assess the administrative homes for MSNS**. In many respects, the location of the management of the MSNS in the P&D department is correct, given the multi sectoral dimensions of the strategy. Depending on outcomes after several years, however, in order to gain further political commitment for nutrition and food security, it might be advisable to move the administrative home of MSNS to the Chief Minister's office.
- **Assess the food security-related departments in the MSNS** to determine whether their structure is adequate.

Explore Funding Options. Balochistan spends more than PKR 26 billion on federal and provincial subsidies on tube wells. The required funds for food security and nutrition initiatives can be found by diverting such subsidies to nutrition-focused and/or productivity-enhancing agricultural R&D. In addition, imposing an agricultural income tax and revenues from sales of public research products can provide long-term support to the agricultural sector. This funding potential is high, since Balochistan has an existing agricultural research system and the Balochistan Agricultural Research Board is under development.

A.3.3.3. Priority Actions Specific to Food Security

This section presents action items specifically for improving food security in Balochistan.

Build Capacities in Relevant Departments. In Balochistan, the Agricultural Department has a 1,800 field assistants and thus the potential to be a strong support for the farm sector. Livestock and other departments have similar numbers of employees. However, at least in the Agricultural Department, many of these assistants have little training and only high school degrees, with very little actual experience on farms. Thus, they need further education and practical experience. Analysis is needed to determine the most effective approaches to enhance the capacity of these employees to support the farm sector. Progressively, the private sector should take over, but it needs to be determined when and in what areas.

Capitalize on High Value Fruit and Vegetable Production. Balochistan has the potential to specialize in high value fruit and vegetables using rather large farms. Participants in the provincial consultations said that the potential for employment generation on these farms is high, but the issue is the lack of processing and marketing operations to support the expansion of fruit and vegetable production. While there are numerous options, one potential approach is to create an Agricultural Marketing Regulatory Authority to shift the government to a more regulatory role for agricultural marketing, and to encourage more engagement from the private sector, as is being attempted in Punjab. Some important considerations include the roles of traditional and small-scale processors; incentives to diversify; innovative ways to improve fortification; and food safety regulation.

Enhance Agricultural Research. Balochistan has the enabling legislation for a provincial agriculture research board, and has dedicated space and some personnel. This board has the potential to link research institutions, extension workers, rural development associations and farmers, and to support

public-private partnerships. The research program should include nonagricultural science activities (beyond biology, plant science and animal breeding, etc.) and should reach out beyond the public sector research institutions and universities.

Explore Other Suggestions. Many additional ideas were proposed during the consultations, including: Optimal use of rain water harvesting, Index-based crop and livestock insurance schemes; ICT-based mapping and zoning of agriculture; cluster-based approaches to agriculture; credit facilities; improved livestock vaccination systems through cold boxes; milk collection centers; better genetic potential of indigenous livestock and community based development and management of rangelands along with property rights.

A.3.3.4. Priority Actions Specific to Nutrition

Adopt and Enforce Relevant Policies. Recommended actions specific to nutrition in Balochistan include adoption and enforcement of the following key policies to track, review and promote nutrition outcomes:

- *Protection of Breastfeeding and Child Nutrition Act.* This law was passed federally in 2002, and endorsed by Balochistan in 2012, but it must be translated into tangible implementation actions.
- *Salt Iodization Acts***.** Balochistan adopted salt iodization in 2015, but implementation of this policy is poor. Development of strategies to ensure successful implementation are necessary.
- *Food Fortification Acts***.** Mostly donor-related efforts have been made for food fortification, through GAIN and MI, and Balochistan mandated wheat flour fortification in 2014. Legislation for fortified oil is needed, with mechanisms for quality assurance and cost reductions by food processors.
- *Early Marriage Restraint Act***.** Balochistan should pass legislation similar to that in Sindh to prohibit early marriage, before the age of 18, with severe penalties for any violation. Passage and strict enforcement of such a law would help ensure delays in marriage, thereby preventing adolescent mothers from entering the intergenerational cycle of stunting and poverty.

Improve Program Implementation. Research should inform the design of nutrition programs that are context appropriate, gain community acceptance, and meet actual community-level needs. Also needed are process evaluations and M&E systems with periodic cross-cutting reviews of funds, as well as measurable indicators and time-bound goals to create accountability. These systems will help determine feasibility and identify bottlenecks for full-scale implementation. A web-based knowledge management portal for nutrition should be considered, with all information accessible needs to promote lessons learnt, identify best practices, and avoid duplication of efforts.

A program using CMAM interventions aimed at eliminating severe malnutrition in Kalat (estimated to cost PKR 39,600 per person (UNICEF,2012)) would cost a total of PKR 1.50 billion. If Awaran and Jaffarabad are included, the cost goes up to PKR 3.80 billion. Covering severely underweight children in the top 5 districts with the largest number of severely underweight children would cost PKR 5.70 billion, while covering the top 10 districts would cost in the range of PKR 9 billion. Ultimately, these costs could drop by using a lifecycle approach to nutrition, progressively seeing adolescents as the first point of intervention, followed by pregnant and lactating women, which is needed to stop the intergenerational

transmission of poor growth and development in children. CMAM programs with built-in compliance monitoring at schools can be very effective. Furthermore, horizontal integration of such programs, supported by community mobilization, could help ensure that marginalized segments of the population are reached. The MSNS can link these programs with school monitoring.

The LHW program is a potential resource for identifying those at risk and integrating CMAM programs into the health care system. Enhancing the capacity of frontline health workers (LHWs CHWs, LHVs and Medical Officers at BHU/RHC) for screening for acute malnutrition, counseling parents and dispensing SNF can increase coverage and ensure effective treatment of SAM and MAM on an out-patient basis.

Develop Human Resources. We recommend creation of dedicated nutrition positions in programs and hiring of qualified nutrition experts. To achieve these goals requires long-term human resource development initiatives. First, curricular standards and requisites on nutrition competencies need to be established and made a mandatory part of medical education and training as well other academic courses. Second, evaluations of existing nutrition-related community programs suggest a need for developing training curricula and conducting in-service refresher trainings. These suggestions should be extended to training teachers and cadres of the school health and nutrition supervisors. Third, development of transparent and robust performance evaluation systems with key performance indicators in the health care system is essential to improve individual performances and consequently organizational performance.

Increase Awareness on Nutrition. To help ensure nutrition messages reach all segments of the population, we recommend dissemination of these messages through various media, including cooking shows. followed by hands on counseling on key topics such a recommended IYCF practices, low cost high nutritional value meal planning, complementary proteins, portion sizes, carbohydrate counting etc. by trained health care workers can ensure messages reach all segments of the population.

Appendix 4: Situation and Gap Analysis for Federally Administered Tribal Areas (FATA), with Proposed Priority Actions

The Food Security and Nutrition Strategic Review is an independent, analytical and consultative exercise designed to identify the key challenges faced by Pakistan in achieving food security and improved nutrition, and to provide prioritized areas for action for the Government of Pakistan and all development partners. In an effort to make the review an inclusionary process and better understand implementation efforts, the technical team from IFPRI and AKU held two consultative workshops in each province and region.

FATA comprises seven Tribal Agencies and six Frontier Regions (FRs), and is governed directly by Pakistan's federal government through a special constitutional arrangement. The administrative head of each Tribal Agency is a Political Agent (PA), who is appointed by the Governor of KP.

Facilitated by the FATA Secretariat, the consultative workshop held in Peshawar, KP, was widely attended by members of government, local NGOs and United Nations officials. On December 13, 2016, the technical team also re-visited Peshawar to present their conclusions to a similar stakeholder group.

In the first section of this appendix, we review the status of nutrition and food security in FATA, beginning with an assessment of the nutritional status of children and its immediate and underlying determinants. This approach follows the structure in Chapter 3 in the main report, but focuses on the specific context of FATA. The second section of this appendix presents gaps related to food security and nutrition, including gaps in food availability, food accessibility, WASH issues and policy, following the structure in Chapter 4. The third section of this appendix recommends a set of priority actions for FATA, which follows the structure in Chapters 4 and 5 of the main report.

A.4.1. Nutritional and Food Security Status in FATA

The main goal of this Strategic Review is to inform the government and stakeholders about the situation, gaps and recommendations related to improving nutrition and food security. The starting point is to assess nutritional status as reported in the UNICEF framework for children. We then look at the immediate determinants, including dietary intake and maternal health status. We broaden the review by looking at the underlying determinants of the nutritional status, including especially issues related to food insecurity.

A.4.1.1. Nutritional Status of Children

Table A.4-1 shows the main consequences for children from malnutrition, as reported in different data sources. According to the FATA Development Indicators Household Survey FDIHS 2015, the rate of underweight children under five was 29.3%, wasting was 14.7%, and stunting was 48.6%. Compared to the MICS (2009) for FATA, the underweight prevalence in 2015 declined by almost 4%, but wasting prevalence appears to have risen by about 2%. In 2015, the stunting and wasting in FATA were higher than for Pakistan overall by almost 4%, while the underweight prevalence was close to the average across Pakistan. The stunting rate in FATA is in WHO's very high prevalence category, while FATA's

underweight and wasting levels were just below the most severe levels in the WHO cut off ranges. Rates of infant and under five year mortality are about 10% higher in FATA than nationally.

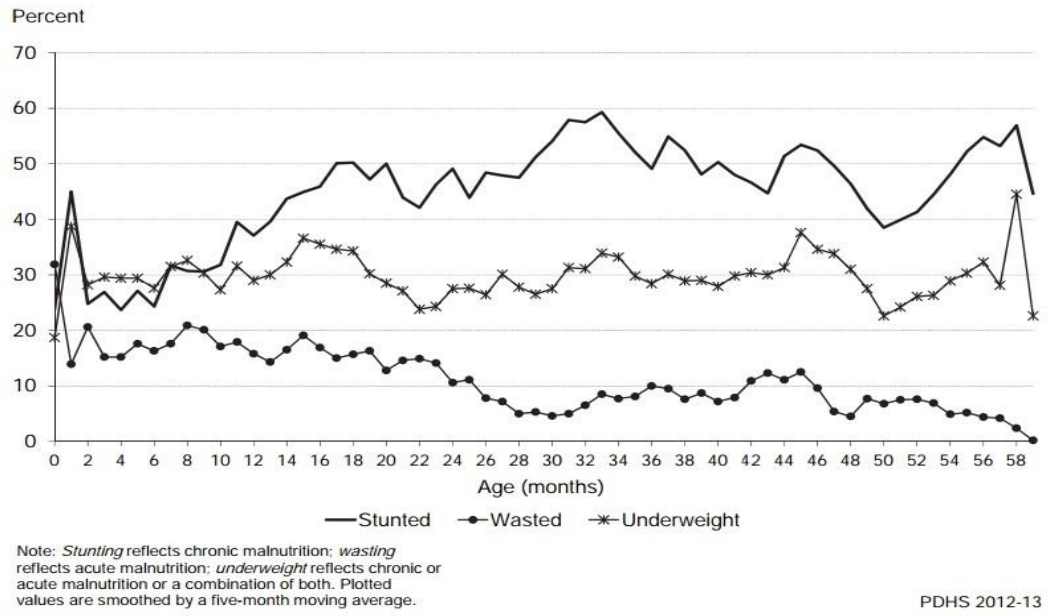
Table A.4-1: Anthropometrics/Mortality of Children under Five in FATA

	FATA		Pakistan		
	FDIHS 2015	MICS 2009	NNS 2001	NNS 2011	PDHS 2013
Underweight	29.3	33.2	41.5	32	30
Stunting	48.6	-	31	44	45
Wasting	14.7	13	12	15	11
Infant Mortality		86	-	78*	74
Under Five Mortality		104	-	94*	89

Note: * Data from PDHS 2007

The time path of stunting, wasting and underweight proportions is instructive to view to show challenges that arise when attempting to improve children's nutrition. The national situation derived from the PDHS 2013 shows that 26% of children are stunted *at birth*, more than 30% are wasted, and about 20% are underweight. Compromised maternal nutrition along with poor IYCF practices leads to increased children's malnourishment from 6 months until 23 months, so that 50% of children are stunted, while wasting declines to 10%. The underweight prevalence worsens to about 30% at two years of age, but stays around the same average afterwards. After two years, the increase in stunting still occurs, but at a much lower rate. See Figure A.4-1.

Figure A.4-1: Nutrition Status of Children by Age, PDHS 2013



Additionally, severe micronutrient deficiencies exist among children, with vitamin A most prevalent among children under five. As shown in Table A.4-2, almost all children in FATA are vitamin A deficient, 26% are iron deficient, 34% are zinc deficient and 26% are vitamin D deficient. In the absence of adequate dietary practices, micronutrient requirements must be met with supplements. Nationally, the PDHS 2013 notes that only 11% of children aged 6-59 months received iron supplements in the last 7 days. Such malnourished children have higher risk of morbidity (both infectious and non-communicable diseases) and mortality. Moreover, these children have lower IQ and poor educational performance, physical growth and development (Victora and Rivera, 2014). Therefore, the role of nutrition, combined with proper IYCF practices, is crucially important.

Table A.4-2: Micronutrient Deficiencies in Children Under Five in FATA

	FATA		Pakistan		
	NNS 2011	MICS 2009	NNS 2001	NNS 2011	PDHS 2013
Vitamin A	100	-	13	54	-
Iron	26	-	67	33	-
Zinc	34	-	37	39	-
Vitamin D	26	-	-	40	-

Additional factors related to children's health in FATA reveal significant differences among Tribal Agencies and FRs (FDIHS, 2015). For example, 33.9% of children 12-23 months in FATA are fully immunized (29.4% in FRs and 34.4% in the Agencies), with double the rate (67.8%) fully immunized in Kurram Agency, but less than half the rate (12.3%) immunized in Orakzai Agency. Also, 27.9% of children aged 0-59 months experienced illness in the last 30 days, but the rate is much higher in Kurram Agency (43.3%) and in Mohmand Agency (53.7%).

A.4.1.2. Immediate Determinants

The children's nutrition status presented above is affected by two immediate factors, including the mother's health status and the dietary intake within the family and by a child. These are discussed below.

Maternal Health Status. A mother's health status is an important determinant of children's health at birth and thereafter. Limited maternal nutrient reserves lead to intrauterine growth retardation, as 80% of an infant's iron and zinc stores are accumulated in the last trimester of pregnancy. Furthermore, compromised maternal nutrition affects the composition of breast milk, as many nutrients are secreted in human milk at the expense of maternal reserves, especially micronutrients such as vitamins B_6, B_{12}, A, and D.

Widespread micronutrient deficiencies are found among non-pregnant women across FATA (NNS, 2011), with vitamin A deficiency being almost double the national rate and vitamin D about 50% above the rest of the country. Iron deficiency in FATA is actually lower than the average across Pakistan. Table A.4-3 shows these differences in micronutrient deficiency levels between FATA and Pakistan generally. These deficiencies can translate into growth problems in unborn children.

Table A.4-3 : Maternal Micronutrient Deficiencies in FATA

	Vitamin A (Both Severe and Moderate)		Vitamin D		Iron		Zinc	
	Pregnant Women (%)	Non-Pregnant Women (%)	Pregnant Women (%)	Non-Pregnant Women (%)	Pregnant Women (%)	Non-Pregnant Women (%)	Pregnant Women (%)	Non-Pregnant Women (%)
Pakistan NNS - 2001	-	6	-	-	-	45	-	46
Pakistan NNS-2011	46	42	69	67	25	19	48	41
FATA NNS-2011	0	83	0	85	0	16	-	-

Dietary Intake. The prevalence of undernourishment in FATA is well above the national average, at 42%. Overall, 69% of households in FATA have average food consumption lower than 2,350 kcals per adult equivalent per day, and 54% of households have borderline food consumption. In addition, 40% of households have low dietary diversity, leading to a high prevalence of food-based micronutrient deficiencies, including vitamin A (87%), iron (94%), zinc (56%) and protein (60%), as shown in Table A.4-4 (GoP, 2017).

Table A.4-3: Inadequacies in Caloric and Micronutrient Intake in FATA (GOP, 2017)

	Diet Quantity			Under-nutrition			
				% of HH with food based micro-nutrient deficiencies			
	Average per capita kcal consumption	% of HH below 2350 kcal per adult equivalent per day	Prevalence of under-nourishment (PoU)	Protein	Vitamin-A	Iron	Zinc
Pakistan	2,360	44	18	32	77	68	40
FATA	1,951	69	42	60	87	94	56

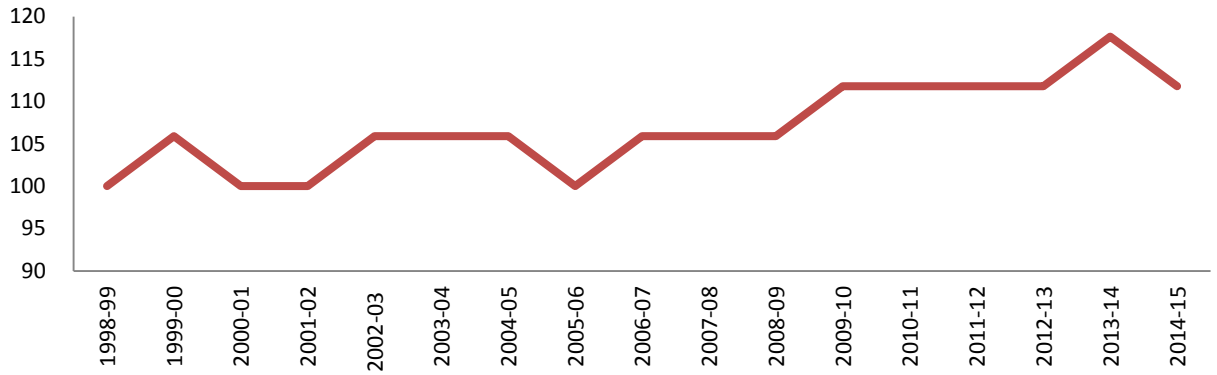
A.4.1.3. Underlying Determinants

In this section, important underlying determinants are reported, including availability and accessibility of food, WASH factors and the role of selected policies.

Food Availability. During the last 17 years in FATA, crop yields per acre of land had to increase by 12% to maintain the same per capita food availability over time (GoP, 2014b), which is much lower than the national increase of 56% for the same time period, as Figure A.4-2 shows, in large part because of significant population movements. Starting in 2008, conflicts have caused the out-migration of about 3.8 million inhabitants of FATA, a very high proportion of the estimated population of 4.6 million in 2015. As of 2015, approximately 1.3 million FATA residents were still displaced. Therefore, it is hard to compare food production in FATA with other regions in the country. Most crop yields have declined in FATA except surprisingly rice yields increased 3.2%, more than the 2.1% population increase in FATA, as shown in Table A.4-4. FATA is not self-sufficient in terms of food production and depends highly on food purchases from KP and Punjab to meet basic food needs. More than 40% of households were unable to fulfil their basic food needs, and 66% of households were in debt to meet these basic needs. While it is

possible to rely on imports rather than domestic production, unlocking productivity in agriculture is essential to encourage population stability, to reduce the cost of a nutritious diet, to allow labor to transition into industry and higher-level services, and to permit scarce government revenues, currently used for subsidies, to be shifted to higher payoff uses.

Figure A.4-2: Population Pressure on Cultivated Land Area in FATA



Source: Agriculture Statistics of Pakistan (Various Issues) and Population Estimates from Population Census, 1998.

Table A.4-4: Crop Yield and Population Growth Rates in FATA

	Wheat	Rice	Maize	Sugarcane	Pulses	Vegetables	Fruits	Population
FATA*	-0.9	3.2	-2	-0.9	-	-	-	2.1
Pakistan**	1.6	1.0	3.6	1.0	0.6	0.9	0.1	2.4

Source: Agriculture Statistics (Various Issues) and Economic Survey of Pakistan, 2013-14
* The 17-years growth in crop yields and population from 1998-2014 is sourced from Development Statistics of Pakistan, 2015
**The 34-year population and crop yields growth rate from 1981 to 2014 is sourced from Economic Survey of Pakistan, 2015-16

Food Accessibility. FATA has the highest headcount of multidimensional poverty across Pakistan, at 74% (NNS, 2011). In addition, food expenditures are highest in FATA and account for 53% of total household expenditures (GoP, 2017). Labor wages are the primary source of income in FATA, with 26% of households dependent on labor wage income.

On the physical accessibility front, FATA remains far behind the rest of the country. The urban population in FATA was 7.4% in 2010, only a small increase compared to 6.7% in 1994, while the urban population nationally grew to 32.3% by 2010 (Kedir, Schmidt, and Waqas, 2016). Although 85.3% of households have electricity connections in FATA, electric power is only available for about three and half hours per day. FATA also suffers from a lack of health facilities, long distances to reach them, and a lack of equipment, medicines and skilled personnel (FDIHS, 2015).

WASH Issues. Access to improved (mostly covered) water sources and improved sanitation facilities has increased, yet only 38.3% of households have a flush toilet facility, and pit latrines are still widely used by 52% of households (FDIHS 2015). Only 4% of the population needs to travel more than 30 minutes to get drinking water in FATA. The source of drinking water for almost a third of FATA residents (31.4%) is

canal, pond, river, stream, or spring water, while 25.3% use a hand pump and only 8.9% have piped water. FDIHS data shows that 59.2% of households do not have a formal garbage collection system, and 40.1% manage privately.

Policies. Significant steps have been taken in drafting nutrition-support and food security policies in FATA. In 2014, FATA initiated three relevant policies related to sanitation, drinking water and agriculture, which are in the approval process. The status of relevant FATA policies is summarized in Table A.4-5.

Table A.4-5: Policies in FATA

Policy	Year	Details
FATA Sanitation Policy	2014	Approval Phase
FATA Drinking Water Policy	2014	Approval Phase
FATA Agriculture Policy	2014	Approval Phase

A.4.2. Gaps in Food Security and Nutrition

The three days of regional consultations along with an in-depth desk review highlighted a series of gaps and challenges hindering progress in achieving food and nutrition security in FATA. These gaps are presented in three subsections below. The first subsection indicates gaps related to both nutrition and food security. The next subsections present gaps specific to food security, followed by nutrition.

A.4.2.1. Gaps Related to Both Food Security and Nutrition

Data Gaps. While there is a dearth of regular food security and nutrition related surveys for all regions of Pakistan, this is especially true for FATA (as well as GB and AJK). Data pertaining to FATA for periodic household surveys such as the HIES and PSLM is not released alongside that for the four provinces, thus creating issues in data comparison and accessibility later on. Similarly, data on the FATA agriculture sector is not made available as comprehensively as it is for the provinces. Given the importance of adequate, timely and reliable data for evidence-based policy making, this lack of collection and publication of data is a major gap.

Policy and Governance Gaps. FATA has a unique political structure in which sovereignty is a partnership between the federal government and local communities (*jirgas*). A history of complex emergencies, resulting in millions of Temporarily Displaced Persons TDPs and a political structure that must support several diverse ethnic and tribal groups makes regulating essential health services quite difficult in this region. The federal government approved the merger of FATA with KP on March 2, 2017, along with a PKR 110 billion development package for FATA.[28,29]

[28] https://www.dawn.com/news/1318095/cabinet-approves-steps-for-fatas-merger-with-khyber-pakhtunkhwa .

[29] This package will be utilized for reconstruction of infrastructure, houses and shops, socio-economic development, establishment of elected local bodies, introduction of judicial reforms to, capacity building of law enforcement agencies land

With regard to specific policies related to nutrition and food security, FATA drafted sanitation, drinking water and agriculture policies in 2014, but these are still in the approval process. The Protection of Breastfeeding and Child Nutrition Ordinance was passed nationally in 2002, but has not yet been endorsed by FATA. In addition, the MSNS and Integrated PC-1s are not in effect, and there is no FATA legislation on salt iodization or food fortification or relevant institutions such as the Food Fortification Alliance.

Writing a policy does not ensure impact. For any policy to be successful, adequate funding is needed, as is a structure to mobilize, evaluate, and redirect funds. Additional challenges for policy implementation include the need for technical human resources and systems for monitoring and evaluation; making sure that diverse stakeholders are included; and securing investments from the private sector.

Accessibility Gaps. A lack of affordability is possibly the biggest hindrance to food security in FATA. Real incomes in the lowest quintile have risen at a much slower rate than in the highest quintiles, and the unemployment rate is higher than the national average for Pakistan. A lack of employment opportunities poses serious concerns for the already difficult food security situation. In the absence of food affordability, social protection plays a key role. While many social protection programs[30] are underway in FATA, they clearly fall short, given that FATA continues to have the highest rates of poverty across the country.

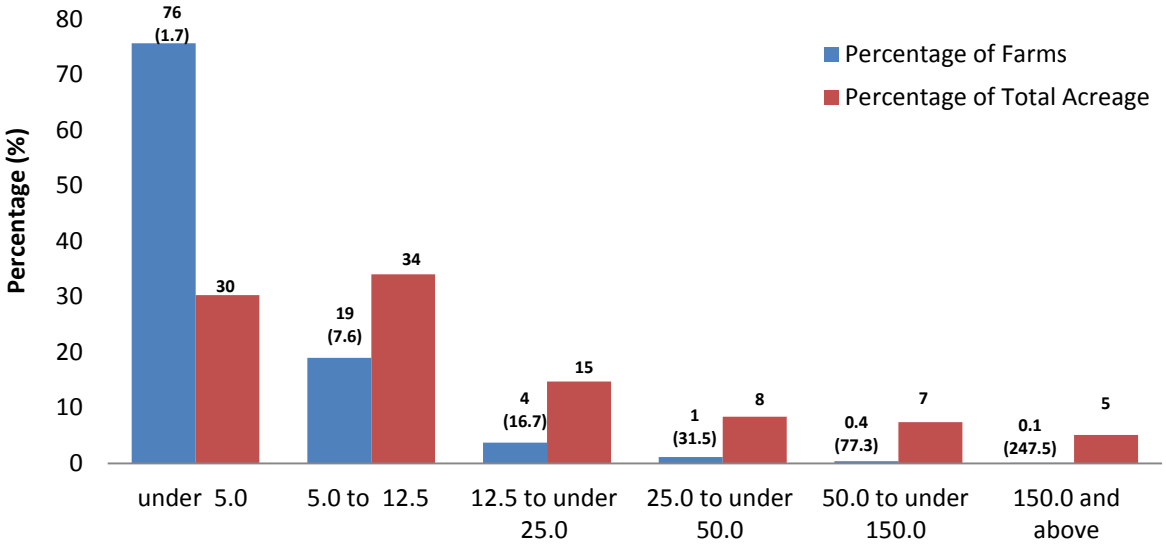
A.4.2.2. Gaps Specific to Food Security

Availability Gaps. The major challenges for food availability in FATA include low growth in agricultural yields and mass population displacements. The growing proportion of small farms further exacerbates the issue, as 95% of farms in FATA, comprising more than 64% of total acreage, are less than 12.5 acres, as shown in Figure A.4-3. Furthermore, there is limited access to agricultural inputs (affordable quality seed, fertilizer, pesticide and planting material etc.) and extension services as well as a limited capacity of extension agents to provide reliable information to farmers. Other issues that challenge food production in FATA include lack of focus on surface water harvesting, mismanagement of rangelands, climate change, marketing and distribution, and long-term sustainability of agricultural productivity. These issues are discussed in detail in Chapter 4 and do not vary significantly by region.

settlement and GIS-based computerized land records, and capacity building of the Frontier Constabulary for efficient border management.

[30] For this regional discussion, we do not address national social protection programs, such as the BISP, as the gaps and recommendations are similar across regions and have already been covered in the main report.

Figure A.4-3: Farm Size in FATA, in Acres



Source: Development statistics of FATA, 2015
Note: Numbers in parentheses show average farm size

A.4.2.3. Gaps Specific to Nutrition

Absence of Nutrition-sensitive Schemes for WASH. A recent analysis found that only about one-quarter of stunting could be alleviated by nutrition specific interventions alone, with an implication that the potential role of WASH is very high (Bhutta et al., 2013). FATA has made some progress by drafting drinking water and sanitation policies in 2014, but these are still pending approval. Improving access to water has a range of benefits, including time and energy savings for women and children, and lower diarrhea prevalence (Cumming and Cairncross, 2016). Overall, 42% of FATA's population has access to improved water sources, but there are significant differences in access, with 92.9% of urban households having access, compared to only 39.3% in rural areas. In addition, only 28% use improved sanitation, adversely affecting the nutritional status of children (GoP,2009c). Sub-optimal WASH facilities in schools contribute to school absenteeism and high drop-out rates, especially among girls during menstruation.[31] School drop-out rates among girls are associated with marriages and motherhood in adolescence, causing an intergenerational cycle of stunting and poverty. Creative solutions are needed for WASH investments that help nutrition.

Program Implementation Gaps. Until recently, FATA programs have focused mainly on short-term acute malnutrition to address the needs of TDPs. As rehabilitation efforts come to a close, policymakers need to shift priorities to address the management and prevention of chronic malnutrition among the entire population. The problem of reliable up-to-date data could be resolved in the next National Nutrition Survey in 2017, but additional actions are needed to bring nutrition to the top of the political agenda.

[31] http://documents.worldbank.org/curated/en/576391490881393712/pdf/113884-WP-PUBLIC-ADD-SERIES-Water-and-sanitation-program.pdf

CMAM programs are confined to limited locations within FATA and have patchy coverage and no link with mainstream government programs or the health care system. In remote areas, the availability of human resources to deliver the program is an issue, and referral rates remain low. In addition, CMAM is cost-intensive when imports of RUTF are used, before local alternatives can be devised. Despite varying models of school health programs being implemented, little progress has been seen in health indicators or adoption of health seeking behaviors, so a successful and sustainable model with a nutrition package is yet to be developed. Among the Tribal Agencies of FATA for which data were available,[32] the three Agencies with the highest estimated number of severely underweight children are Khyber Agency, Mohmand Agency and South Waziristan. Each of these Agencies have between 18,000 and 22,000 severely underweight children. Together, these three Agencies include about 54% of the SAM-afflicted children in the Agencies with available data.

In FATA, limited coverage by LHWs is a particular challenge due to past military operations and sparse population. Furthermore, integration of LHW services with BHUs is uneven due to weak referral systems. Other issues include weak logistics and lack of separate adult and baby weighing scales. Moreover, process evaluations during programs and impact evaluation after programs are limited. Those programs that were evaluated did not effectively embed findings in scaling-up plans.

Lack of Awareness on Nutrition. Existing literature has consistently found that education and nutritional awareness among women plays a vital role in determining the dietary practices of households. Data for FATA from a plethora of nutrition-focused surveys confirms that nutrition indicators improve with increasing maternal educational levels, as well as wealth quintiles. At present, low literacy levels, media influences and pre-existing cultural beliefs/taboos (such as beliefs that fortification/polio vaccines cause impotency or that hot and cold food should be consumed for certain illnesses) adversely affect dietary practices. This problem is compounded by an absence of nutrition concepts in school curricula and teacher induction programs. During the consultations, participants expressed a common concern that most nutrition programs lack effective BCC strategies. Community mobilization also is limited when designing nutrition interventions.

Human Resource Gaps. The improvement of nutrition in FATA requires that the health care system as well as the development sector have human resources with appropriate nutrition-related knowledge and skills. At present, there is limited capacity among existing health care providers in nutrition, and a dearth of nutrition experts in the development sector. One reason is that nutrition is not given enough emphasis in medical curricula, other academic programs or in-service training. Stakeholders raised concerns about the absence of performance appraisals, refresher trainings, supportive supervision and regular disbursement of salaries, which adversely affect motivation levels and lead to underperformance among health care workers. In addition, rapid turnover of management in nutrition programs, exemplified by the recent newly-appointed staff of the IRMNCH program in FATA, was seen to hinder effective leadership.

[32] Data were unavailable (in the MICS for FATA) for North Waziristan and Lakki Marwat, and it was not possible to estimate the population in the Frontier Region of Bannu.

A.4.3. Priority Actions for Food Security and Nutrition

This section presents recommended action items for improvements in food security and nutrition in FATA. The first subsection relates to national recommendations that require regional support. The next subsections present priority actions related to both food security and nutrition, followed by specific recommendations related to each topic separately.

A.2.3.1. National-level Recommendations that Need Regional Support

The following general and overarching actions, highlighted in the main report, should be part of all programs or policy developments, and should be supported and implemented by stakeholders in FATA:

- **Establish a nutrition and food security surveillance system**, in line with SDG targets and indicators, and ensure its data requirements are met. The NNS 2011, for example, missed nutritional data on adolescents due to over-reporting, poor recording, high refusal rates, low bioavailability due to dietary practices and interrupted/inadequate supply of supplements.
- **Create of a culture of monitoring, evaluation and research** that helps define how to implement and scale up potentially valuable programs.
- **Identify and empower female champions for change** at the household and community levels in all programs and implementation structures, including microfinance for women and interventions that bring positive change for women in the household power structure.

Additionally, a set of analyses, policies, and programs appropriate to most provinces and regions are presented in Chapter 5 and are summarized briefly here.

- **Evaluate current social protection programs** for potential coverage, costs and likely benefits, with nutrition sensitive components added whenever they can be effective. While universal social protection is perhaps a long-term goal, immediate challenges are to reach the urban poor and landless rural inhabitants. This review could examine if awareness programs within BISP, increasing payments, and graduation programs are effective to improve outcomes.
- **Finalize policies** under review at the national level **and implement them fully** through the regional government and other stakeholders. These include a National Water Policy, which has been drafted; a National Seed Amendment that was passed in 2015; and a Plant Breeder Rights Act in 2016. The implementation of these policies has been slow.
- **Conduct comparative analysis of best approaches for BCC strategies** related to nutrition, particularly for breastfeeding campaigns, as current programs show little long-term effect. Analysis is needed of the value of broader nutrition campaigns and the potential use of community social structures for promoting nutrition knowledge. BCC strategies also should include mechanisms to sensitize males on women's health issues.
- **Review the role of primary and secondary healthcare facilities and other locations for SNF delivery** (particularly since SNF programs are not a top option economically – (Shekar et al., 2016)); assess the feasibility of integrating CMAM programs into the community-based health care delivery system; and enhance capacity of LHWs and primary and secondary care doctors to screen for acute malnutrition.

- Assess the potential for schools to **add basic nutrition education and WASH concepts in teacher training programs,** and assess the expected nutritional impact of improving WASH facilities in schools, primary healthcare units and other locations to identify those that are most cost-effective and have the highest impact on nutrition outcomes.

A.2.3.2. Priority Actions Related to Both Food Security and Nutrition

We offer one general recommendation specific to FATA and related to both food security and nutrition.

Keep the Merger of FATA with KP in the Spotlight. The merger process should continue on track and be finalized and implemented as soon as possible. After the merger, the FATA region will benefit from the same facilities and services existing in KP.

A.4.3.3. Priority Actions Specific to Food Security

This section presents action items specifically for improving food security in FATA.

Adopt and Implement Relevant Policies. FATA has an agricultural policy under development, and it needs to be ensured that the policy is developed and followed through to implementation. The policy needs an implementing body with the capacity to provide oversight for policy implementation, the right composition of stakeholders included, independence to act, and technical capacity to design associated legislation and supporting programs. The policy needs to be finalized and should facilitate an appropriate balance between accessibility and availability, which is often not the case. The policy also needs effective implementing structures and associated PC-1s.

Encourage Small Commercial Farms.[33] For sustained agriculture-led, inclusive growth and ensured food availability, FATA should enable and support small commercial farms. These farms can adopt new technology better than smaller farms, and can demand rural non-farm goods in greater proportions, thereby helping poor non-farm households in rural areas through this demand. Currently over 80% of the country's agricultural income is being derived from such small commercial farm holdings.

Improve Input Supplies. Input supply improvements should include setting up farm service centers and increasing registration of farmers to reach a broader group; increasing the number of farmer field schools and ensuring farmers' access; orienting demonstration centers to cater to small farms; and strengthening the links among research institutions, extension workers, rural development associations and farmers.

Capitalize on Marketing Opportunities. The partnership among universities, the private sector and the government for the development and marketing of medicinal and aromatic plants could play a crucial role in improving marketing opportunities. Assessments of the valleys like Swat could contribute to other improvements, such as enhancing the roles of traditional and small-scale processors; creating incentives to diversify; identifying innovative ways to improve food fortification and food safety regulation; facilitation of kitchen gardening and small-scale vegetable farming; and food handling

[33] Defined formally, a small commercial farmer produces sufficient output to exceed the poverty level and have capital-intensive urban consumption patterns. Research suggests that it takes 1.4 acres of land (average farm size of under 3 acres) to enable a family of six to meet poverty line expenditures.

training for farmers, especially women. While there are numerous options, one potential approach is to create an Agricultural Marketing Regulatory Authority to shift the government to a more regulatory role for agricultural marketing, and to encourage more engagement from the private sector, as is being attempted in Punjab.

Explore Other Suggestions. Many additional ideas were proposed during the consultations, including:

- Allowing the use of fertilizer in FATA, which has been prohibited
- Encouraging public-private partnerships for watershed and community engagement for the development and management of communal/rangeland management.
- Facilitating and strengthening the capacities of women to contribute to the agriculture sector
- Employing GIS systems for mapping and zoning of agriculture clusters and adopting a cluster-based approach to agriculture, which would, for example, aid in developing seed as per cluster traits.
- Establishing a humanitarian response facility within FATA with the help of WFP to cater the vulnerable situation in the territory.

A.4.3.4. Priority Actions Specific to Nutrition

Adopt and Enforce Relevant Policies. Recommended actions specific to nutrition in FATA include adoption and enforcement of the following key policies to track, review and promote nutrition outcomes:

- *Protection of Breastfeeding and Child Nutrition Act.* This ordinance was passed federally in 2002, and is yet to be endorsed by FATA.
- *Salt iodization Acts***.** FATA has no legislation in place for the mandatory iodization of salt.
- *Food Fortification Acts***.** Mostly donor related efforts have been made for food fortification particularly wheat flour, through GAIN and MI. Fortification of oil has been made mandatory through the Pure Food Rules of 1965. Enactment of legislation for both fortified oil and wheat flour is needed, with mechanisms to empower quality assurance by food processors and encourage reduction in cost.
- *Early Marriage Restraint Act***.** FATA has not passed the Early Marriage Restraint Act to prohibit early marriage before the age of 18. Passage and strict enforcement of this law will help ensure delays in marriage, thereby reducing the number of adolescent mothers entering the intergenerational cycle of stunting and poverty.

Improve Program Implementation. Beyond research to inform the design of nutrition programs that are context appropriate, gain community acceptance, and meet actual community-level needs, process evaluations and M&E systems with periodic cross-cutting reviews of funds are necessary, while measurable indicators and time-bound goals create accountability. These are needed to establish feasibility and identify bottle necks for full-scale implementation. A web-based knowledge management portal for nutrition where all information is made accessible needs to be considered to promote lessons learnt, best practices, and to avoid duplication of efforts.

A CMAM program aimed at eliminating severe malnutrition in the three most afflicted FATA Agencies for which data were available (Khyber, Mohmand and South Waziristan) using the full range of CMAM interventions (estimated to cost PKR 39,600 per person (UNICEF, 2012)) would cost a total of PKR 2.40 billion. If the next two Agencies (Bajaur and Kurram) are included, the cost goes up to PKR 3.70 billion. Covering severely underweight children in all FATA Agencies (excluding North Waziristan, Bannu and Lakki Marwat, for which estimates could not be made) would cost around PKR 4.40 billion. Ultimately, these costs could drop by using a lifecycle approach to nutrition, progressively seeing adolescents as the first point of intervention, followed by pregnant and lactating women to stop the intergenerational transmission of poor growth and development in children. CMAM programs with built-in compliance monitoring at schools can be very effective. Furthermore, horizontal integration of such programs, supported by community mobilization, could help ensure that marginalized segments of the population are reached. The MSNS can pave the way to link these programs with school monitoring.

The LHW program is a potential resource for identifying those at risk and integrating CMAM programs into the health care system. Enhancing the capacity of frontline health workers (LHWs CHWs, LHVs and Medical Officers at BHU/RHC) for screening for acute malnutrition, counseling parents and dispensing SNF can increase coverage and ensure effective treatment of SAM and MAM on an out-patient basis.

Develop Human Resources. We recommend creation of dedicated nutrition positions in programs and hiring of qualified nutrition experts. To achieve these goals requires long-term human resource development initiatives. First, curricular standards and requisites on nutrition competencies need to be established and made a mandatory part of medical education and training as well other academic courses. Second, evaluations of existing nutrition-related community programs suggest a need for developing training curricula and conducting in-service refresher trainings. These suggestions should be extended to training teachers and cadres of the school health and nutrition supervisors. Third, development of transparent and robust performance evaluation systems with key performance indicators in the health care system is essential to improve individual performances and consequently organizational performance.

Increase Awareness on Nutrition. To help ensure nutrition messages reach all segments of the population, we recommend dissemination of these messages through various media, including cooking shows. followed by hands on counseling on key topics such a recommended IYCF practices, low cost high nutritional value meal planning, complementary proteins, portion sizes, carbohydrate counting etc. by trained health care workers can ensure messages reach all segments of the population.

Appendix 5: Situation and Gap Analysis for Gilgit Baltistan, with Proposed Priority Actions

The Food Security and Nutrition Strategic Review is an independent, analytical and consultative exercise designed to identify the key challenges faced by Pakistan in achieving food security and improved nutrition, and to provide prioritized areas for action for the Government of Pakistan and all development partners. In an effort to make the review an inclusionary process and better understand implementation efforts, the technical team from IFPRI and AKU held two consultative workshops in each province and region.

Facilitated by the GB Planning and Development Department, the consultative workshops held in Gilgit, GB were widely attended by members of government, local NGOs and United Nations officials. On January 17, 2017, the technical team also re-visited Gilgit to present their conclusions to a similar stakeholder group.

In the first section of this appendix, we review the status of nutrition and food security in GB, beginning with an assessment of the nutritional status of children and its immediate and underlying determinants. This approach follows the structure in Chapter 3 in the main report, but focuses on the specific context of GB. The second section of this appendix presents gaps related to food security and nutrition, including gaps in food availability, food accessibility, WASH issues and policy, following the structure in Chapter 4. The third section of this appendix recommends a set of priority actions for GB, which follows the structure in Chapters 4 and 5 of the main report.

A.5.1. Nutritional and Food Security Status in GB

The main goal of this Strategic Review is to inform the government and stakeholders about the situation, gaps and recommendations related to improving nutrition and food security. The starting point is to assess the nutritional status of the vulnerable population, particularly children. We broaden the review by looking at the immediate determinants of this nutritional status, including issues related to maternal health and dietary intake, as well as the underlying determinants, including food insecurity, WASH issues and regional policies.

A.5.1.1. Nutritional Status of Children

Table A.5-1 shows the main consequences for children associated with malnutrition and food insecurity, as reported in different data sources. Inadequate dietary intake and maternal health status among households in GB translates into 36% of children being stunted, 13% underweight and 8% wasted (PDHS, 2013) While GB has a lower percentage of underweight and wasted children in comparison with the national averages, the prevalence of stunting was higher according to the NNS 2011 (but lower than the national average according to the PDHS 2013) and affects more than half of children. Despite this relatively positive data, infant and under five mortality in GB are similar to national averages. With increasing literacy levels and development in the region, there has been a decrease in the proportion of

underweight, stunted and wasted children. However, these improvements have been uneven, with significant disparities among districts.

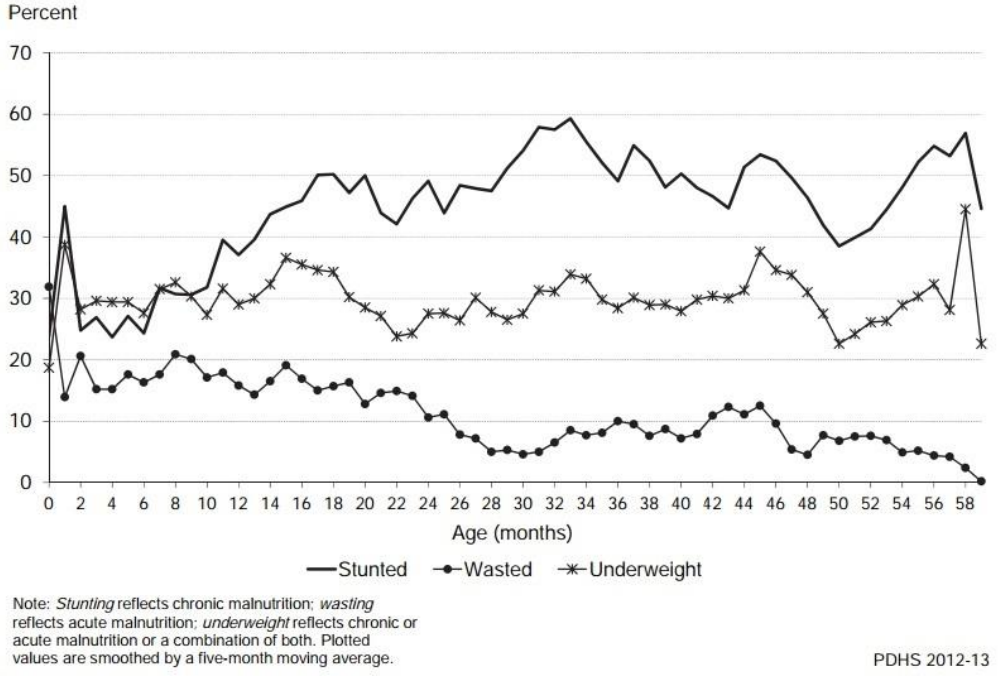
Table A.5-1: Anthropometrics/Mortality in Children Under Five in GB

	GB		Pakistan		
	NNS 2011	PDHS 2013	NNS 2001	NNS 2011	PDHS 2013
Underweight	26	13	41.5	32	30
Stunting	51	36	31	44	45
Wasting	7	8	12	15	11
Infant Mortality	-	71	-	*78	74
Under Five Mortality	-	89	-	*94	89

Note: * Data from PDHS 2006-07

The time path of stunting, wasting and underweight proportions is instructive to view to show challenges that arise when attempting to improve children's nutrition. The national situation derived from the PDHS 2013 shows that 26% of children are stunted *at birth*, more than 30% are wasted, and about 20% are underweight. Compromised maternal nutrition along with poor IYCF practices leads to increased children's malnourishment from 6 months until 23 months, so that 50% of children are stunted, while wasting declines to 10%. The underweight prevalence worsens to about 30% at two years of age, but stays around the same average afterwards. After two years, the increase in stunting still occurs, but at a much lower rate. See Figure A.5-1.

Figure A.5-1: National Nutrition Status of Children by Age, PDHS 2013



With regard to micronutrient deficiencies among children, aside from vitamin A, GB performs better than other regional averages. As shown in Table A.5-2, 72% of children are vitamin A deficient, 20% iron

deficient, 33% zinc deficient and 37% vitamin D deficient. Nevertheless, only 23% of all children aged 6-23 months in GB had adequate dietary intake with regard to all three IYCF practices as recommended by the WHO (MAD, minimum meal frequency and intake of breast milk) (NNS, 2011; PDHS, 2013). Such malnourished children have higher risk of morbidity (both infectious and non-communicable diseases) and mortality. Moreover, these children have lower IQ and poor educational performance, physical growth and development. Therefore, the role of nutrition, with proper IYCF practices, is crucially important.

Table A.5-2. Micronutrient Deficiencies in Children Under Five in GB

	GB		Pakistan		
	NNS 2011	PDHS 2013	NNS 2001	NNS 2011	PDHS 2013
Vitamin A	72	-	13	54	-
Iron	20	-	67	33	-
Zinc	33	-	37	39	-
Vitamin D	37	-	-	40	-

A.5.1.2. Immediate Determinants

The children's nutrition status presented above is affected by two immediate factors, including the mother's health status and the dietary intake within the family and by a child. These are discussed below.

Maternal Health Status. A mother's health status is an important determinant of children's health at birth and thereafter. Limited maternal nutrient reserves lead to intrauterine growth retardation, as 80% of an infant's iron and zinc stores are accumulated in the last trimester of pregnancy. Furthermore, compromised maternal nutrition affects the composition of breast milk as many nutrients are secreted in human milk at the expense of maternal reserves, especially micronutrients such as vitamins B_6, B_{12}, A, and D. GB has relatively better IYCF practices compared to other regions. Only 10% of mothers provide their children with pre-lacteal feed and 60% mothers' initiate breastfeeding within the first hour of birth (PDHS, 2013). Furthermore, the proportion of children consuming MAD rose from 4% to 23% within the span of two years from 2011 to 2013. The proportion of children fed the minimum number of times as per recommendation also doubled from 30% to 61% in the same time period. Research finds that pre-lacteal feeding is a major barrier to early initiation of and exclusive breastfeeding and increases the risk of infections.

Widespread micronutrient deficiencies are found among pregnant and non-pregnant women across GB (NNS, 2011), with vitamin D deficiency being the most prevalent among women. Table A.5-3 shows some differences in micronutrient deficiency levels between non-pregnant and pregnant women, especially for iron. Iron deficiency is almost three times as high in pregnant women (29% versus 10%). These deficiencies can translate into growth problems in unborn children. Zinc deficiency is lower among pregnant women than non-pregnant females. Furthermore, anthropometric measurements under PDHS 2013 revealed that 15% of women were overweight or obese, while 5% were underweight, raising the double burden of disease.

Table A.5-3: Maternal Micronutrient Deficiencies in GB

	Vitamin A (Both Severe and Moderate)		Vitamin D		Iron		Zinc	
	Pregnant Women (%)	Non-Pregnant Women (%)	Pregnant Women (%)	Non-Pregnant Women (%)	Pregnant Women (%)	Non-Pregnant Women (%)	Pregnant Women (%)	Non-Pregnant Women (%)
Pakistan NNS - 2001	-	6	-	-	-	45	-	46
Pakistan NNS-2011	46	42	69	67	25	19	48	41
GB NNS-2011	44	39	76	81	29	10	54	64

Dietary Intake. The prevalence of undernourishment in GB is well above the national average, at 51%. Overall, 68% households have average food consumption lower than 2,350 kcals per adult equivalent per day, exceeding the national average, and 43% of households have poor food consumption scores. In addition, 44% of households have low dietary diversity, leading to a high prevalence of food-based micronutrient deficiencies, including protein (45%), vitamin A (97%), zinc (87%) and iron (82%), as shown in Table A.5-4 (GoP, 2017).

Table A.5-4: Inadequacies in Caloric and Micronutrient Intake in GB (GoP, 2017)

	Average per capita kcal consumption	Diet Quantity % of HH below 2350 kcal per adult equivalent per day	Prevalence of under-nourishment (PoU)	Under-nutrition % of HH with food-based micronutrient deficiencies			
				Protein	Vitamin-A	Iron	Zinc
Pakistan	2,360	44	18	32	77	68	40
Gilgit Baltistan	1,973	68	51	45	97	82	87
Gilgit	2,209	57	36	25	97	70	79
Baltistan	1,809	76	61	59	97	89	93

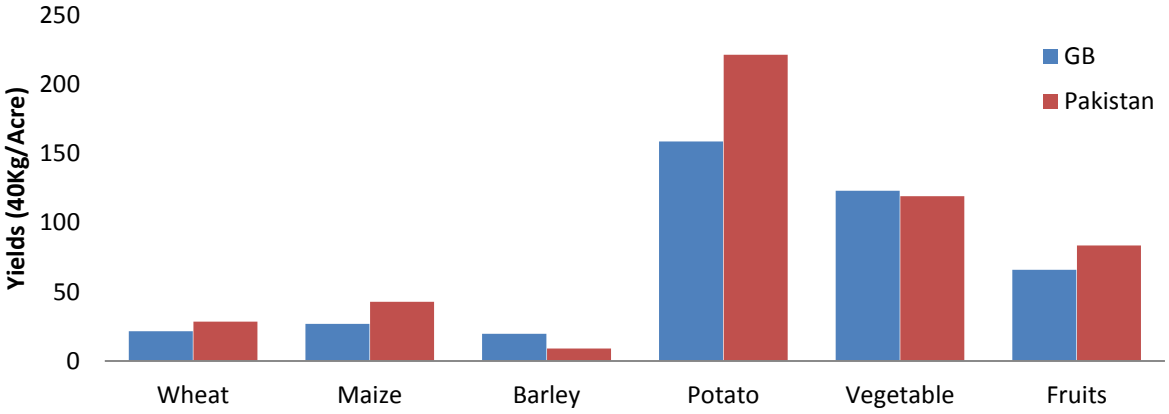
A.5.1.3.Underlying Determinants

In this section, important underlying determinants are reported, including food availability and accessibility.

Food Availability. Aside from barley and vegetables, the crop yield growths in GB are significantly lower than in the rest of the country, as shown in Figure A.5-2. Resultantly, GB is predominantly a net importer of food, with a subsidy in place for wheat availability. While it is possible to rely solely on imports rather than domestic production, unlocking productivity in agriculture is essential to reduce the cost of a nutritious diet, especially in GB where the potential for specialization in high value crops is high.

F

igure A.5-2: Crop Yields in GB and Nationwide



Source: Gilgit Baltistan at a Glance, 2013.

Food Accessibility. With a multidimensional poverty rate of 43.2%, a large proportion of the GB population is deprived in terms of access to health, education, and basic standards of living (GoP, 2016a). The variation in incidence of poverty is large across rural and urban areas, while the intensity of poverty is high throughout. Due to limited employment opportunities, GB is plagued with a high unemployment rate. Out-migration to major cities across Pakistan is high, predominantly among male members of households. On the physical accessibility front, though GB has made significant improvements over the past five decades in terms of expansion of roads and transportation networks, some areas in the northern region are still very remote, with inadequate access to roads connected to major cities.

WASH Issues. WASH issues are closely related to food accessibility and nutrition. Access to improved (mostly covered) water sources and improved sanitation facilities has increased, but in GB, only 27% of schools have all basic facilities (safe drinking water, boundary wall, electricity and toilets). Overall, 64% schools did not have toilet facilities and 48% did not have access to safe drinking water (Alif Ailaan, 2016).

Policies. Because of the location of GB in the mountainous region, and its role in the headwaters of the Indus rivers system, as well as the dependence on livestock as opposed to traditional crops, as in most provinces, the policy requirements are different. Because GB must import wheat, the federal government has given GB a subsidy for many years, which will be PKR 100 million during 2017. Policy-makers should determine whether this is the best use of funds. Climate change policies are also important for GB, as changing weather patterns have the potential to force changes in livelihoods. From another perspective, the management of rangelands and forests in GB can alter the sediment load that mainly affects downstream users of water and infrastructure. Thus there is a case to be made that GB could obtain payments for rangeland improvements that lead to downstream benefits.

A.5.2. Gaps Related to Food Security and Nutrition

The three days of regional consultations along with an in-depth desk review highlighted a series of gaps and challenges hindering progress in achieving food and nutrition security in GB. These gaps are presented in three subsections below. The first subsection indicates gaps related to both nutrition and food security. The next subsections present gaps specific to food security, followed by nutrition.

A.5.2.1. Gaps Related to Both Food Security and Nutrition

Data Gaps. While there is a dearth of regular food security and nutrition related survey data for all regions of Pakistan, this is especially true for GB (as well as AJK and FATA). Data pertaining to GB for periodic household surveys such as the HIES and PSLM is not released alongside the data for the four provinces, thus creating issues in data comparison and accessibility later on. Similarly, data on the GB agriculture sector is not made available as comprehensively as it is for the provinces. Given the importance of adequate, timely and reliable data for evidence-based policy making, this lack of collection and publication of data is a major gap.

Policy and Governance Gaps. In addition to the forest and agricultural policies discussed above, some relevant policies have not been adopted yet in GB. The Protection of Breastfeeding and Child Nutrition Ordinance was passed nationally in 2002, but has not been endorsed by GB. In addition, the Integrated PC-1 for MSNS is not in effect in GB. On the other hand, GB was the first region to enact the Iodine Deficiency Disorder Control Act in 2009. However, the implementation of this law has been poor, as evidenced by NNS 2011, with only 15% of the population consuming adequately iodized salt. Furthermore, other legislation on food fortification are absent in the region, and a Food Fortification Alliance is yet to be developed.

Writing a policy does not ensure impact. For any policy to be successful, adequate funding is needed, as is a structure to mobilize, evaluate, and redirect funds. Additional challenges for policy implementation include the need for technical human resources and systems for monitoring and evaluation; making sure that diverse stakeholders are included; and securing investments from the private sector.

Accessibility Gaps. Aside from remoteness in the northern-most parts of GB, a lack of affordability is possibly the biggest obstacle to food security in the region. Real incomes in the lowest quintile have risen at a much slower rate than in the highest quintiles, and the GB unemployment rate is higher than the national average for Pakistan. A lack of employment opportunities and the resultant urban migration pose a serious concern for the already difficult food security situation. In the absence of affordability, social protection plays a key role. While many social protection programs[34] are underway in GB, they clearly fall short, given the high headcount poverty in the region. Being highly prone to natural disasters, GB faces an additional challenge of potential breakdown in physical accessibility of food in such cases. The lack of strategic food reserves for emergencies is another major gap to sustained food accessibility.

[34] For this regional discussion, we do not address national social protection programs, such as the BISP, as the gaps and recommendations are similar across regions and have already been covered in the main report.

A.5.2.2. Gaps Specific to Food Security

Availability Gaps. One of the major challenges for food production in GB is the low growth in agricultural yields, stemming from small and scattered land holdings (average 1.5 acres). In addition, nearly 75% of arable land can only be used for a single summer crop due to harsh climatic conditions. There is also limited access to agricultural inputs (affordable quality seed, fertilizer, pesticide and planting material, etc.) and agricultural extension services due to the scattered and small farms in the region and low operational capacity of departments and workers. The lack of coordination among research institutes, the extension department and the community is an added challenge. Another major issue in GB is the unavailability of adequate water for agriculture despite the high potential for surface water harvesting and unavailability of electricity at farms as well as long outages in cities.

There is also a lack of focus on R&D, especially on affordable climatic-tolerant varieties. With regard to livestock, productivity is still below potential. Unsuitable breed's high fodder requirements are imported from Punjab, but fodder is quite scarce in winter in GB. Post-harvest losses are high in fruits and vegetables, at around 40% to 50%, mainly due to weak infrastructure, lack of value chain services available at the farm level, knowledge and awareness among farmers, accessibility to markets, and availability of timely market information at farm level and lack of knowledge about preservative techniques.

Other issues that challenge food production in GB include climate change, marketing and distribution, and long-term sustainability of agricultural productivity. These issues are discussed in detail in Chapter 4 and do not vary significantly by province or region.

A.5.2.3. Gaps Specific to Nutrition

Absence of Nutrition-sensitive Schemes for WASH. A recent analysis found that only about one-quarter of stunting could be alleviated by nutrition specific interventions alone, with an implication that the potential role of WASH is very high (Bhutta et al., 2013). GB has made progress by drafting a sanitation policy, which is still pending approval.[35] Improving access to water has a range of benefits, including time and energy savings for women and children, and lower diarrhea prevalence (Cumming and Cairncross, 2016). A majority of the population in GB (79.5%) has access to improved water sources. However, 95% of the population does not treat drinking water. In addition, 82% have access to improved sanitation, but 8% still practices open defecation, adversely affecting the nutritional status of children. These factors contribute to school absenteeism and high drop-out rates, especially among girls during menstruation (PDHS, 2013). School drop-out rates among girls are associated with marriages and motherhood in adolescence, causing an intergenerational cycle of stunting and poverty. Creative solutions are needed for WASH investments that help nutrition.

[35] Pakistan country paper on sanitation, SACOSAN VI 2016
http://www.washwatch.org/uploads/filer_public/a5/3e/a53e8c45-d8eb-4557-82da686d5529840d/country_paper_sacosan_vi_pakistan2016.pdf

Program Implementation Gaps. CMAM programs are confined to limited districts within GB and have patchy coverage and no link with mainstream government programs or the health care system. In remote districts, the availability of human resources to deliver the program is an issue, and referral rates remain low. In addition, CMAM is cost intensive due to the imports of RUTF before local alternatives are devised. Despite varying models of school health programs being implemented, little progress was seen in health indicators or adoption of health seeking behaviors, so a successful and sustainable model with a nutrition package is yet to be developed. Among the districts of GB, the three districts with the highest estimated number of severely underweight children are Baltistan, Gilgit and Dimar. Each of these districts is estimated to have between 13,000 and 17,000 severely underweight children. Together, these three districts include about 69% of the SAM-afflicted children in the region.

In GB, limited coverage by LHWs is a particular challenge due to the mountainous terrain and sparse population. Integration of LHW services with BHUs is uneven due to weak referral systems. Other issues include weak logistics and lack of separate adult and baby weighing scales. Moreover, process evaluations during programs and impact evaluation after programs are limited. Those programs that were evaluated did not effectively embed findings in scaling-up plans.

Lack of Awareness on Nutrition. Existing literature has consistently found that education and nutritional awareness among women plays a vital role in determining the dietary practices of households. Data for GB from a plethora of nutrition-focused surveys confirms that nutrition indicators improve with increasing maternal educational levels, as well as wealth quintiles. At present, low literacy levels, media influences and pre-existing cultural beliefs/taboos (such as beliefs that fortification/polio vaccines cause impotency, or that hot and cold foods should be consumed for certain illnesses) adversely affect dietary practices. This problem is compounded by an absence of nutrition concepts in school curricula and teacher induction programs. In addition, during the two rounds of consultations, participants expressed a common concern that most nutrition programs lack effective BCC strategies, contributing to low exclusive breastfeeding rates (15%) and high pre-lacteal feeding in the region. Community mobilization also is limited when designing nutrition interventions.

Human Resource Gaps. The improvement of nutrition in GB requires that the health care system as well as the development sector have human resources with appropriate nutrition-related knowledge and skills. At present, there is limited capacity among existing health care providers in nutrition, and a dearth of nutrition experts in the development sector. One reason is that nutrition is not given enough emphasis in medical curricula and in-service training. Stakeholders raised concerns about the absence of performance appraisals, refresher trainings, supportive supervision and regular disbursement of salaries, which adversely affect motivation levels and lead to underperformance among health care workers. In addition, rapid turnover of management in nutrition programs, exemplified by the recent newly-appointed staff of the IRMNCH program in GB, was seen to hinder effective leadership.

A.5.3. Priority Actions for Food Security and Nutrition

This section presents recommended action items for improvements in food security and nutrition in GB. The first subsection relates to national recommendations that require regional support. The next subsections present priority actions related to both food security and nutrition, followed by specific recommendations related to each topic separately.

A.5.3.1. National-level Recommendations that Need Regional Support

The following general and overarching actions, highlighted in the main report, should be part of all programs or policy developments, and should be supported and implemented by stakeholders in GB:

- **Establish a nutrition and food security surveillance system**, in line with SDG targets and indicators, and ensure its data requirements are met. The NNS 2011, for example, missed nutritional data on adolescents due to over-reporting, poor recording, high refusal rates, low bioavailability due to dietary practices and interrupted/inadequate supply of supplements.
- **Create of a culture of monitoring, evaluation and research** that helps define how to implement and scale up potentially valuable programs.
- **Identify and empower female champions for change** at the household and community levels in all programs and implementation structures, including microfinance for women and interventions that bring positive change for women in the household power structure.

Additionally, a set of analyses, policies, and programs appropriate to most provinces and regions are presented in Chapter 5 and are summarized briefly here.

- **Evaluate current social protection programs** for potential coverage, costs and likely benefits, with nutrition sensitive components added whenever they can be effective. While universal social protection is perhaps a long-term goal, immediate challenges are to reach the urban poor and landless rural inhabitants. This review could examine if awareness programs within BISP, increasing payments, and graduation programs are effective to improve outcomes.
- **Finalize policies** under review at the national level **and implement them fully** through the government and other stakeholders. These include a National Water Policy, which has been drafted; a National Seed Amendment that was passed in 2015; and a Plant Breeder Rights Act in 2016. The implementation of these policies has been slow.
- **Conduct comparative analysis of best approaches for BCC strategies** related to nutrition, particularly for breastfeeding campaigns, as current programs show little long-term effect. Analysis is needed of the value of broader nutrition campaigns and the potential use of community social structures for promoting nutrition knowledge. BCC strategies also should include mechanisms to sensitize males on women's health issues.
- **Review the role of BHUs and other locations for SNF delivery** (particularly since SNF programs are not a top option economically – (Shekar et al., 2016)); assess the feasibility of integrating CMAM programs into the community-based health care delivery system; and enhance capacity of LHWs and BHU doctors to screen for acute malnutrition.

- Assess the potential for schools to **add basic nutrition education and WASH concepts in teacher training programs,** and assess the expected nutritional impact of improving WASH facilities in schools and other locations to identify those that are most cost-effective and have the highest impact on nutrition outcomes.

A.5.3.2. Priority Actions Related to Both Food Security and Nutrition

In this section, we offer recommendations specific to GB and related to both food security and nutrition.

Adopt and Implement Relevant Policies. GB needs to adopt and implement a series of policies in the areas of food security and nutrition. Now that the GB MSNS has been approved, the relevant cells need to be created and integrated PC-1s need to be put in place for funding. The related cells should be housed in the P&D department, and they should have the mandate to review projects for gender-sensitive as well as nutrition-sensitive components. The departments related to food security have more of their mandate outside the MSNS, so an assessment should be conducted after several years about whether this structure is adequate to address food security.

Explore Funding Options. The general funding situation is difficult in GB for a number of reasons. Since GB is not a province, it does not get a National Finance Commission award. As most inhabitants are rural, the tax base is small, and given the likelihood of expensive disaster relief needed at times, extra funds for development purposes are not readily available. Taxes on tourism, transport and exports of fruit and livestock products may be the best options in the short term to raise funds. The wheat subsidies and distribution system may be the most reliable support for unreached groups in GB currently, but this issue should be evaluated.

A.5.3.3. Priority Actions Specific to Food Security

This section presents action items specifically for improving food security in GB.

Increase Productivity. The agricultural sector is not a large part of the economy in GB, since farms are small and tend to be based on livestock and oriented towards self-sufficiency. One option is to raise the productivity of dairy and meat animals, perhaps with the development of cooperative marketing and distribution functions. The same kind of development could be done for fruit production. The GB government should also explore the possibility of bringing in the private sector to do the same functions.

Fund Agricultural Research. GB needs to find a way to fund agricultural research that is adapted to the region. The research program should include nonagricultural science activities (beyond biology, plant science and animal breeding etc.) and should reach out beyond the public sector research institutions and universities. One suggestion is to build joint research programs with other mountainous areas. Another idea is to specialize in certain types of crops and livestock that can be expanded in the region.

Invest in Forests and Rangelands. It is very important to invest in forests and rangelands in order to improve the region's productivity and rehabilitate a key natural resource. The rangelands are a huge resource and, if managed correctly, have the possibility to increase the region's economic growth, add

to sustainability, productivity and food accessibility for poor and unreached populations. The management of these valuable resources needs to be tracked and supported.

Adopt and Enforce Relevant Policies. GB has an agricultural policy under development, with a Technical Working Group established to ensure that the policy is developed and followed through to implementation. The policy needs to be finalized and should ensure an appropriate balance between food accessibility and availability, which is often not the case. The policy also should have some type of Commission authorized to provide oversight for policy implementation. The Commission needs to include the right composition of stakeholders, and must have independence to act and technical capacity to develop associated regulations and supporting programs. In addition, GB has not put in place enabling legislation for a regional agriculture research board. These institutions have the potential to link research institutions, extension workers, rural development associations and farmers, and to support public-private partnerships. Such an institution would be an important addition to agricultural development approaches in GB.

Explore Other Suggestions. Many additional ideas were proposed during the consultations, including: Index-based crop and livestock insurance schemes; ICT-based mapping and zoning of agriculture; cluster-based approaches to agriculture; credit facilities; improved livestock vaccination systems through cold boxes; milk collection centers; and developing better genetic potential of indigenous livestock.

Capitalize on Marketing Opportunities. The partnership among universities, the private sector and the government for the development and marketing of medicinal and aromatic plants could play a crucial role in improving marketing opportunities. Assessments of the valleys like Swat could contribute to other improvements, such as enhancing the roles of traditional and small-scale processors; creating incentives to diversify; identifying innovative ways to improve food fortification and food safety regulation; facilitation of kitchen gardening and small-scale vegetable farming; and food handling training for farmers, especially women. While there are numerous options, one potential approach is to create an Agricultural Marketing Regulatory Authority to shift the government to a more regulatory role for agricultural marketing, and to encourage more engagement from the private sector, as is being attempted in Punjab.

A.5.3.4. Priority Actions Specific to Nutrition

Adopt and Enforce Relevant Policies. Recommended actions specific to nutrition in GB include adoption and enforcement of the following key policies to track, review and promote nutrition outcomes:

- *Protection of Breastfeeding and Child Nutrition Act.* This ordinance was passed federally in 2002, and is yet to be endorsed by GB.
- *Salt iodization Acts***.** GB made iodization of salt mandatory in 2009, however, implementation is poor. Close monitoring and development of strategies to insure successful implementation are necessary.
- *Food Fortification Acts***.** Mostly donor-related efforts have been made for food fortification, particularly wheat flour, through GAIN and MI. Fortification of oil has been made mandatory

through the Pure Food Rules of 1965. Enactment of legislation is needed for both fortified oil and wheat flour, with mechanisms to empower quality assurance by food processors and encourage reduction in cost.

- *Early Marriage Restraint Act*. GB has not passed the Early Marriage Restraint Act to prohibit marriage before the age of 18. Passage and strict enforcement of this law will help ensure delays in marriage, thereby reducing the number of adolescent mothers entering the intergenerational cycle of stunting and poverty.

Improve Program Implementation. Research should inform the design of nutrition programs that are context appropriate, gain community acceptance, and meet actual community-level needs. Also needed are process evaluations and M&E systems with periodic cross-cutting reviews of funds, as well as measurable indicators and time-bound goals to create accountability. These systems will help establish feasibility and identify bottlenecks for full-scale implementation. A web-based knowledge management portal for nutrition should be considered, with all information made accessible to promote lessons learnt, identify best practices, and avoid duplication of efforts.

A CMAM program aimed at eliminating severe malnutrition in the three most afflicted GB districts (Baltistan, Gilgit and Diamir) using the full range of CMAM interventions (estimated to cost PKR 39,600 per person – UNICEF, 2012) would cost a total of PKR 1.8 billion. If the next two districts with the highest number of severely underweight children (Ganche and Astor) are included, the cost goes up to PKR 2.5 billion. Covering severely underweight children in all districts of GB would cost PKR 2.7 billion. These costs are fairly high compared to the subsidies spent on wheat procurement. Ultimately, these costs could drop by using a lifecycle approach to nutrition, progressively seeing adolescents as the first point of intervention, followed by pregnant and lactating women, to stop the intergenerational transmission of poor growth and development in children. CMAM programs with built-in compliance monitoring at schools can be very effective. Furthermore, horizontal integration of such programs, supported by community mobilization, could help ensure that marginalized segments of the population are reached. The MSNS can pave the way to link these programs with school monitoring.

The LHW program is a potential resource for identifying those at risk and integrating CMAM programs into the health care system. Enhancing the capacity of frontline health workers (LHWs CHWs, LHVs and Medical Officers at BHU/RHC) for screening for acute malnutrition, counseling parents and dispensing SNF can increase coverage and ensure effective treatment of SAM and MAM on an out-patient basis.

Develop Human Resources. We recommend creation of dedicated nutrition positions in programs and hiring of qualified nutrition experts. To achieve these goals requires long-term human resource development initiatives. First, curricular standards and requisites on nutrition competencies need to be established and made a mandatory part of medical education and training as well as for other academic courses. Second, evaluations of existing nutrition-related community programs suggest a need for developing training curriculum and conducting in-service refresher trainings. These suggestions should be extended to training teachers and cadres of the school health and nutrition supervisors. Third, development of transparent and robust performance evaluation systems with key performance

indicators in the health care system is essential to improve individual performances and consequently organizational performance.

Increase Awareness on Nutrition. To help ensure messages reach all segments of the population, we recommend dissemination of nutrition messages through various media, including cooking shows. Message dissemination should be supplemented by hands-on counseling by trained health care workers on key topics such as recommended IYCF practices, low-cost high-nutritional value meal planning, complementary proteins, portion sizes, and carbohydrate counting.

Appendix 6: Situation and Gap Analysis for KP, with Proposed Priority Actions

The Food Security and Nutrition Strategic Review is an independent, analytical and consultative exercise designed to identify the key challenges faced by Pakistan in achieving food security and improved nutrition, and to provide prioritized areas for action for the Government of Pakistan and all development partners. In an effort to make the review an inclusionary process and better understand implementation efforts, the technical team from IFPRI and AKU held two consultative workshops in each province and region.

Facilitated by the KP Planning and Development Department, the consultative workshops held in Peshawar, KP, were widely attended by members of government, local NGOs and United Nations officials. On December 16, 2016, the technical team also re-visited Peshawar to present their conclusions to a similar stakeholder group.

In the first section of this appendix, we review the status of nutrition and food security in KP, beginning with an assessment of the nutritional status of children and its immediate and underlying determinants. This approach follows the structure in Chapter 3 in the main report, but focuses on the specific context of KP. The second section of this appendix presents gaps related to food security and nutrition, including gaps in food availability, food accessibility, WASH issues and policy, following the structure in Chapter 4. The third section of this appendix recommends a set of priority actions for KP, which follows the structure in Chapters 4 and 5 of the main report.

A.6.1. Nutritional and Food Security Status in KP

The main goal of this Strategic Review is to inform the government and stakeholders about the situation, gaps and recommendations related to improving nutrition and food security. The starting point is to assess nutritional status as reported in the UNICEF framework for children. We then look at the immediate determinants, including dietary intake and maternal health status. We broaden the review by looking at the underlying determinants of the nutritional status, including especially issues related to food insecurity.

A.6.1.1. Nutritional Status of Children

Table A.6-1 shows the main consequences for children derived from malnutrition, as reported in different data sources. KP performs better compared to the national average in terms of stunting and underweight measures, but the percentage of children wasted is slightly higher in KP (12%) compared to the national rate (11%). Although the rate of stunting is 3% lower in KP than for Pakistan generally, the rate is still alarming at 42%. Rates of infant and under five mortality are lower in KP than nationally.

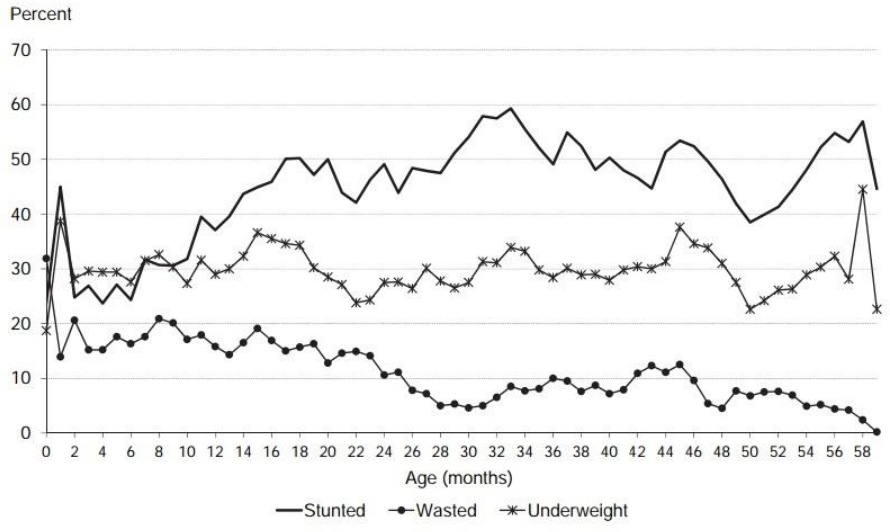
Table A.6-1: Anthropometrics/Mortality of Children Under Five in KP

	KP		Pakistan		
	NNS 2011	PDHS 2013	NNS 2001	NNS 2011	PDHS 2013
Underweight	24	26	41.5	32	30
Stunting	48	42	31	44	45
Wasting	17	12	12	15	11
Infant Mortality	-	58	-	*78	74
Under Five Mortality	-	70	-	*94	89

Note: * Data from PDHS 2006-07

The time path of stunting, wasting and underweight proportions is instructive to view to show challenges that arise when attempting to improve children's nutrition. The national situation derived from the PDHS 2013 shows that 26% of children are stunted *at birth*, more than 30% are wasted, and about 20% are underweight. Compromised maternal nutrition along with poor IYCF practices leads to increased children's malnourishment from 6 months until 23 months, so that 50% of children are stunted, while wasting declines to 10%. The underweight prevalence worsens to about 30% at two years of age, but stays around the same average afterwards. After two years, the increase in stunting still occurs, but at a much lower rate. See Figure A.6-1.

Figure A.6-1: Nutrition Status of Children by Age, PDHS 2013



Additionally, severe micronutrient deficiencies exist among children, with vitamin A most prevalent among children under five. As shown in Table A.6-2, 69% children in KP are vitamin A deficient, 14% are iron deficient, 45% are zinc deficient and 29% are vitamin D deficient. Vitamin A and zinc deficiencies are higher for children in KP than in rest of the country. In the absence of adequate dietary practices, micronutrients requirements must be met with supplements. The PDHS 2013 notes that only 11% of children aged 6-59 months received iron supplements in the last 7 days. Vitamin A supplementation was better, as 81.2% of children received a dose within 6 months. Nevertheless, such malnourished children have higher risk of morbidity (both infectious and non-communicable diseases) and mortality. Moreover, these children have lower IQ and poor educational performance, physical growth and development (Victora & Rivera, 2014). Therefore, the role of nutrition, combined with proper IYCF practices, is crucially important.

Table A.6-2: Micronutrient Deficiencies in Children Under Five in KP

	KP		Pakistan		
	NNS 2011	PDHS 2013	NNS 2001	NNS 2011	PDHS 2013
Vitamin A	69	-	13	54	-
Iron	14	-	67	33	-
Zinc	45	-	37	39	-
Vitamin D	29	-	-	40	-

A.6.1.2. Immediate Determinants

The children's nutrition status presented above is affected by two immediate factors, including the mother's health status and the dietary intake within the family and by a child. These are discussed below.

Maternal Health Status. A mother's health status is an important determinant of children's health at birth and thereafter. Limited maternal nutrient reserves lead to intrauterine growth retardation, as 80% of an infant's iron and zinc stores are accumulated in the last trimester of pregnancy. Furthermore, compromised maternal nutrition affects the composition of breast milk, as many nutrients are secreted in human milk at the expense of maternal reserves, especially micronutrients such as vitamins B_6, B_{12}, A, and D. KP has the second highest percentage (74%) of early initiation of breastfeeding as well as the highest rates of exclusive breastfeeding (47%) across all provinces. On the other hand, pre-lacteal feeding is practiced by 75% of households in KP while 78% of children are not introduced to semi-solid or solid foods at an appropriate age of 6-8 months. Although KP performs marginally better than the other provinces in meeting the MAD and minimum meal frequency for children under two, these statistics still remain low at 14% and 65% respectively.

Widespread micronutrient deficiencies are found among pregnant and non-pregnant women across KP (NNS, 2011), with vitamin A deficiency most prevalent. Table A.6-3 shows some differences in micronutrient deficiency levels between non-pregnant and pregnant women, especially for iron and vitamin A. These deficiencies can translate into growth problems in unborn children.

Table A.6-3: Maternal Micronutrient Deficiencies in KP (NNS, 2011)

	Vitamin A (Both Severe and Moderate)		Vitamin D		Iron		Zinc	
	Pregnant Women (%)	Non-Pregnant Women (%)	Pregnant Women (%)	Non-Pregnant Women (%)	Pregnant Women (%)	Non-Pregnant Women (%)	Pregnant Women (%)	Non-Pregnant Women (%)
Pakistan NNS - 2001	-	6	-	-	-	45	-	46
Pakistan NNS-2011	46	42	69	67	25	19	48	41
KP NNS-2011	76	66	64	61	16	6	45	39

Dietary Intake. The prevalence of undernourishment in KP is slightly above the national average, at 20%. Overall, 49% of households in KP have average food consumption lower than 2,350 kcal per adult equivalent per day. Despite the general availability of nutritious foods in markets and the high levels of urbanization in the province, Household Dietary Diversity Scores for the province reveal that 18% of households consume from fewer than five food groups, and 67.4% of households are below the staple adjusted nutrient threshold (GoP and WFP, 2016a; GoP, 2017). Moreover, data show that a high proportion of total food expenditure goes to wheat, oil, fats and sugar, which are energy dense but of low nutritional value, thus making the lack of dietary diversity more problematic. Resultant food-based micronutrient inadequacies include vitamin A (86%), iron (78%), zinc (59%) and protein (38%), as shown in Table A.6-4 (GoP, 2017).

Table A.6-4: Inadequacies in Caloric and Micronutrient Intake in KP (GoP, 2017)

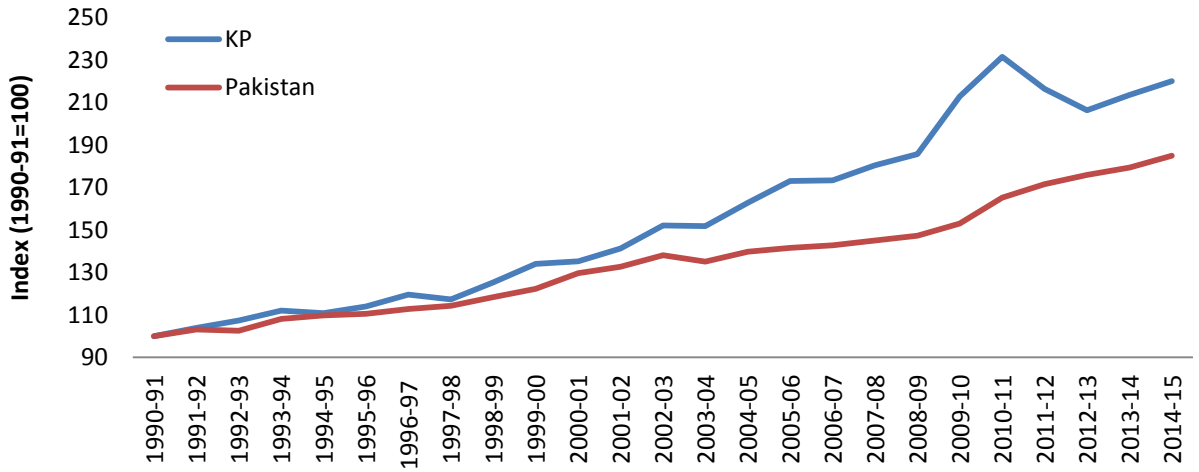
	Diet Quantity			Under-nutrition			
				% of HH with food based micronutrient deficiencies			
	Average per capita kcal consumption	% of HH below 2350 kcal per adult equivalent per day	Prevalence of under-nourishment (PoU)	Protein	Vitamin-A	Iron	Zinc
Pakistan	2,360	44	18	32	77	68	40
KP	2,313	49	20	38	86	78	59
Bannu	2,367	42	14	43	75	85	70
Hazara	2,203	58	30	38	94	80	73
Kohat	2,333	42	19	37	83	84	40
Malakand	2,546	32	8	26	85	67	41
Mardan	2,302	51	23	41	80	77	62
Peshawar	2,179	57	35	49	85	82	54
D.I. Khan	2,395	43	17	39	69	83	74

A.6.1.3. Underlying Determinants

In this section, important underlying determinants are reported, including availability and accessibility of food, WASH factors and the role of selected policies.

Food Availability. During the last 25 years in KP, crop yields per acre of land had to increase by 120% to maintain the same per capita food availability over time (GoP, 2014b), which is much higher than the required national increase of 85%, as Figure A.6-2 shows. The population to be supported on each acre are expected to further increase by 29% from 2015 to 2030. However, Table A.6-5 shows that no crop yields kept up with the provincial population growth (2.5%), and in fact the yields for fruits and vegetables production declined. While it is possible to rely on imports rather than domestic production, unlocking productivity in agriculture is essential to reduce the cost of a nutritious diet, to allow labor to transition into industry and higher-level services, and to permit scarce government revenues, currently used for subsidies, to be shifted to higher payoff uses.

Figure A.6-2: Population Pressure on Cultivated Land Area in KP



Source: Agriculture Statistics of Pakistan (Various Issues) and Population Estimates from Population Census, 1998.
Source: Agriculture Statistics of Pakistan (Various Issues) and Population Estimates from Population Census, 1998.

Table A.6-5: Crop Yield and Population Growth Rates in KP

	Wheat	Rice	Maize	Sugarcane	Pulses	Vegetables	Fruits	Population*
KP	1.1	1.1	1.2	0.4	0.9	-0.6	-0.3	2.5
Pakistan	1.6	1.0	3.6	1.0	0.6	0.9	0.1	2.4

Source: Agriculture Statistics (Various Issues) and Economic Survey of Pakistan, 2013-14
* The 34-year population and crop yields growth rate from 1981 to 2014 is sourced from Economic Survey of Pakistan, 2015-16 and Agriculture Statistics of Pakistan (Various Issues).

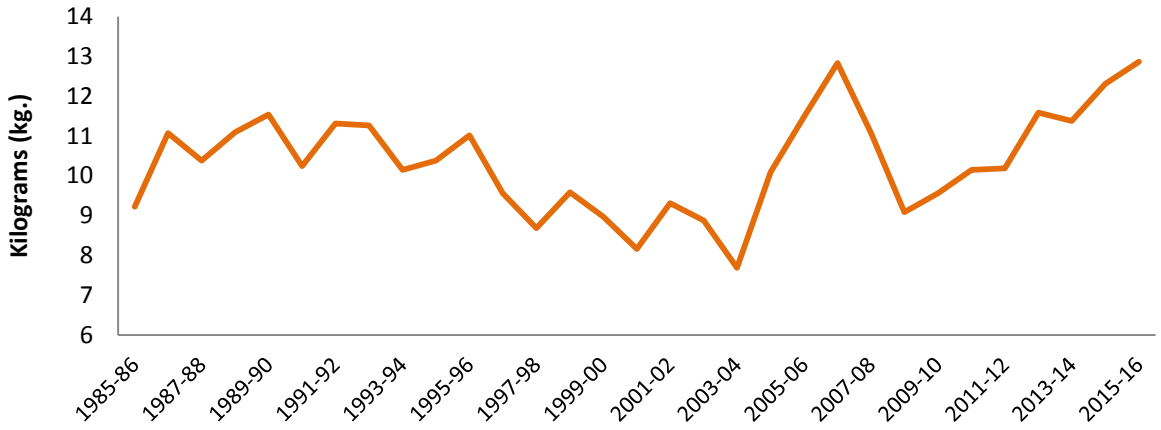
Food Accessibility. Almost half the population in KP is multidimensional poor and deprived in terms of health, education, and basic standards of living (GoP, 2016a). In addition, two out of every three

households in KP are unable to afford a balanced (staple adjusted) nutritious diet given their current levels of food expenditures (GoP and WFP, 2016a).

Household real incomes in KP have gone up since 2001, but the average income growth rate has been twice as high for the top quintile compared to the bottom quintile in urban areas (GoP, 2014a). With regard to daily wages, while the nominal daily wage of unskilled labor in Peshawar more than tripled between 2004-05 and 2015-16, there were large fluctuations in food affordability due to the year-to-year food price volatility, as shown in Figure A.6-3. In more recent years, there is an improving trend, as a day's wages could buy 13 kilograms of wheat in 2015-16, up from 9 kilograms in 2009-10.

On the physical accessibility front, KP has made significant improvements over the past five decades in terms of expansion of roads, transportation and communication, yet some areas of the province are still remote (Kedir, Schmidt, and Waqas, 2016). Village electrification has increased, yet the inconsistent supply of electricity remains an issue, especially in rural areas (PRHPS, 2017). The rate of urbanization in KP is 2.6%, which is lower than the national average of 3.6%.

Figure A.6-3: Kilograms of Wheat Flour Affordable per One Day's Wages in Peshawar



Source: Economic Survey of Pakistan (Various Issues)

WASH Issues. WASH issues are closely related to food accessibility and nutrition. Access to improved (mostly covered) water sources as well as improved sanitation facilities has increased, and almost 75% of households have a flush-toilet facility (PSLM, 2014-15). However, availability of adequate infrastructure and sanitation facilities in schools remains an issue, as only 44% of schools have basic water, sanitation and infrastructure facilities, as compared to 93% in Punjab and 53% nationally (Alif Ailaan, 2016).

Policies. Significant steps have been taken in drafting nutrition-support and food security policies in KP, particularly since the 2010 floods and the federal establishment of the PINS. KP is also the only province currently to have an agricultural policy in place. Some additional major policies are in drafting stage. The

status of several relevant KP laws and policies is summarized in Table A.6-6.

Table A.6-6: Policies in KP

Policy	Year	Details
Protection of Breastfeeding and Child Nutrition Act	2015	Endorsed by KP
KP Food Safety Authority Act	2014	Implementation Phase
KP Agriculture Policy	2015	Implementation Phase
Multi-sectoral Nutrition Strategies and PC-1s	2015	Drafted within the scope of Pakistan Vision 2025
KP Breast Feeding and Child Nutrition Act	2015	Implementation Phase
KP Climate Change Policy	2016	Implementation Phase
KP Biodiversity Action Plan	2016	Implementation Phase

A.6.2. Gaps in Food Security and Nutrition

The three days of provincial consultations along with an in-depth desk review highlighted a series of gaps and challenges hindering progress in achieving food and nutrition security in KP. These gaps are presented in three subsections below. The first subsection indicates gaps related to both nutrition and food security. The next subsections present gaps specific to food security, followed by nutrition.

A.6.2.1. Gaps Related to Both Food Security and Nutrition

Policy and Governance Gaps. Most relevant policies in the KP are very recent and need time to have impact. The Protection of Breastfeeding and Child Nutrition Ordinance was passed nationally in 2002, but only adopted 12 years later in KP (in 2014), followed by the notification of the KP Infant Feeding Board in 2016. These policy decisions resulted in a series of actions to promote breastfeeding, such as publication of notices to all national and multinational producers and distributors of formula milk that they must place a message on their products stating, "Mother's milk is best for the baby." In addition, a working group has been constituted to develop informational materials for health care providers and the public regarding the benefits of breastfeeding. In addition, some hospitals have been piloted as baby-friendly hospitals, and rules of business have been developed and recommendations sent for extension of maternity leave to 60 days from 45 days. Policies regarding salt iodization and food fortification are lacking, except for fortification of oil with vitamin A and D under the Pure Food Rules, and wheat flour fortification and salt iodization efforts from donors, such as GAIN and MI.

Writing a policy does not ensure impact. For any policy to be successful, adequate funding is needed, as is a structure to mobilize, evaluate, and redirect funds. Additional challenges for policy implementation include the need for technical human resources and systems for monitoring and evaluation; making sure that diverse stakeholders are included; and securing investments from the private sector.

Funding Gaps. Stakeholders in KP consultation meetings raised as a major concern the limited funding from government and reliance on donors for nutrition-specific and nutrition-sensitive programs. Other concerns regarding funding modalities included the population-based distribution formula, which led to inequitable funding allocations, depriving districts most in need. The total direct subsidies in KP are PKR

2.9 billion, many of which are for agricultural purposes. If there are five times as many indirect subsidies (for fertilizer, water and wheat procurement costs), then the total subsidy level in KP is close to PKR 18 billion. Much of these funds could go to better uses in nutrition or productivity-enhancing investments.

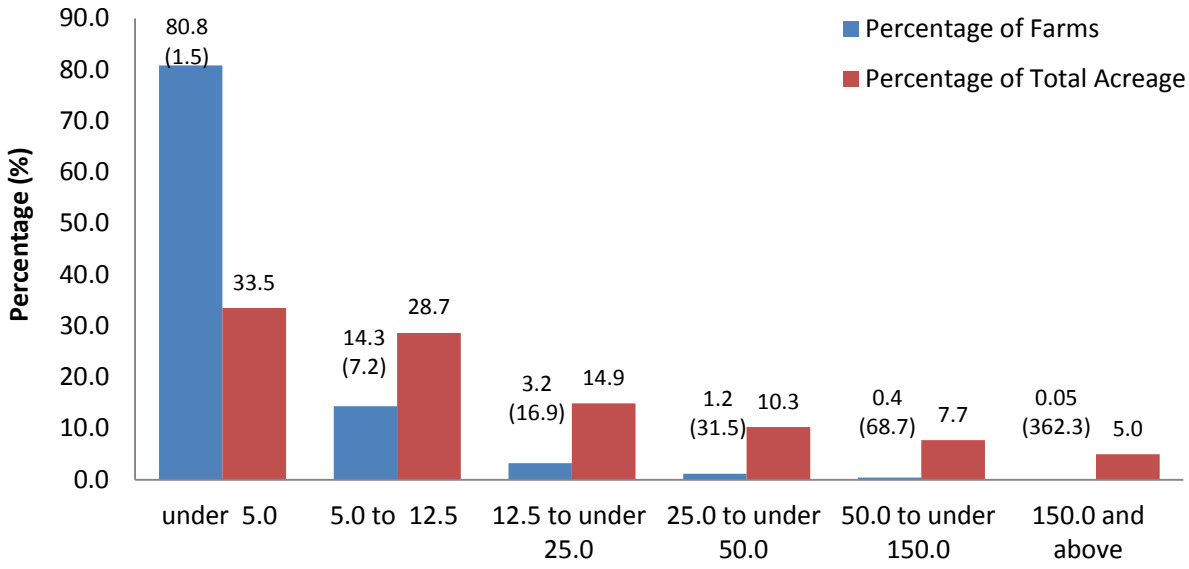
Accessibility Gaps. Despite an adequate food supply in KP, a lack of affordability hinders food security. Real incomes in the lowest quintile have risen at a much slower rate than incomes in the highest quintiles, so a balanced diet remains out of the reach of almost 69% of rural households, given their current food expenditures. Any economic growth in KP has not been inclusive or equitable. As in most of rural Pakistan, a lack of rural non-farm employment opportunities in the province, and the resultant urban migration, poses a serious concern for the already difficult food security situation. In the absence of affordability, social protection plays a key role. While many social protection programs[36] are underway, they clearly fall short, given that half the population in KP faces multidimensional poverty.

A.6.2.2. Gaps Specific to Food Security

Availability Gaps. Possibly the most critical issue for food availability in KP is the increasing number of farms with less than five acres of land, which makes agricultural productivity highly challenging. Figure A.6-4 shows the percentage of farms and total acreage of different farm sizes. More than 80% of farms in KP are less than 5 acres in size, with an average farm size of only 1.5 acre. These small farms collectively command 33% of the total acreage in the province. Most of this acreage is coming from fragmentation of mid-sized farms, which fall in the small commercial farmer category. This fragmentation is a concern because small commercial farmers have a significant role in productivity growth and poverty reduction. (See Chapter 4 for a detailed discussion on work by Mellor and Malik, 2017.)

Figure A.6-4: Farm Size in KP, in Acres

[36] For this provincial discussion, we do not address national social protection programs, such as the BISP, as the gaps and recommendations are similar across provinces and have already been covered in the main report.



Source: Agriculture Census (Various Issues)
Note: Numbers in parentheses show average farm size

For sustained agricultural production, traditional inputs cannot be the engines of growth, as land, tube wells, water, and even fertilizer and tractors have reached their maximum contribution. While the use of indigenous improved seed has been growing, it is costly, often unavailable, and inconsistent in quality. With the growing number of small farms and input use saturation, advancements in agricultural R&D are crucial, but spending on R&D remains low in KP, as in the rest of the country. Other issues that challenge agricultural production in KP include climate change, marketing and distribution, and long-run sustainability. These issues are discussed in detail in Chapter 4 and do not vary significantly by province.

A.6.2.3. Gaps Specific to Nutrition

Absence of Nutrition-sensitive Schemes for WASH. A recent analysis suggests that only about one-quarter of stunting could be alleviated by nutrition-specific interventions alone, which indicates that the potential role of WASH might be significant (Bhutta et al., 2013). KP has made good progress in increasing access to improved drinking water sources, which has a range of benefits, including time and energy savings for women and children, and lower diarrhea prevalence (Cumming and Cairncross, 2016). However, the majority of households (96%) do not treat water, and poor water quality is particularly an issue in urban areas. In addition, while 62% of households have access to sanitation facilities, open defecation and sub-optimal WASH conditions in schools are still common in rural areas, adversely affecting the nutritional status of children. These factors contribute to school absenteeism and high drop-out rates, especially among girls during menstruation. [37] School drop-out rates among girls are associated with early marriages and motherhood in adolescence, thus initiating an intergenerational cycle of stunting and poverty. Creative solutions are needed for WASH investments that help nutrition.

[37] http://documents.worldbank.org/curated/en/576391490881393712/pdf/113884-WP-PUBLIC-ADD-SERIES-Water-and-sanitation-program.pdf

Program Implementation Gaps. In a recent years, KP initiated health programs with a major nutrition component focusing on CMAM has been rolled out in 23 districts out of 25 districts of KP. The stabilization centers have been established and staff has been trained. Although, CMAM is cost-intensive when imports of RUTF are used, before local alternatives are devised. Despite varying models of school health programs being implemented, little progress has been seen in health indicators or adoption of health seeking behaviors, so a successful and sustainable model with a nutrition package is yet to be developed. Among the districts of KP, the three districts with the highest estimated number of severely underweight children are Peshawar, Swat and Charsadda. Each of these districts has between 22,000 and 29,000 severely underweight children, and the three districts account for about 40% of the total number of SAM-afflicted children.

Stakeholders in KP highlighted as a challenge the limited coverage by LHWs, particularly in suburbs and slums. In addition, integration of LHW services with BHUs is uneven due to weak referral systems. Other issues included weak logistics and lack of separate adult and baby weighing scales. Moreover, process evaluations during programs and impact evaluation after programs are limited. Those programs that were evaluated did not effectively embed findings in scaling-up plans.

Lack of Awareness on Nutrition. The literature consistently suggests that education and nutritional awareness among women plays a vital role in determining the dietary practices of households. Data from a plethora of nutrition-focused surveys confirms that nutrition indicators improve with increasing maternal educational levels, as well as wealth quintiles. Low literacy levels coupled with media influences and cultural beliefs/taboos (such as beliefs that fortification/polio vaccines cause impotency, or that hot and cold foods should be consumed for certain illnesses) adversely affect dietary practices. The situation is amplified by an absence of nutrition concepts in school curricula and teacher induction programs. During the consultations, participants expressed a common concern that most nutrition programs lack effective BCC strategies, contributing to low exclusive breastfeeding rates and high pre-lacteal feeding (75%) in the province. Community mobilization also is limited when designing nutrition interventions.

Human Resource Gaps. To achieve improved nutrition in KP, the health care system as well as the development sector should have human resources with credible nutrition expertise. At present, there is limited capacity among existing health care providers in nutrition, and a dearth of nutrition experts in the development sector. One reason is that nutrition is not given enough emphasis in medical curricula and in-service training. Stakeholders pointed out that performance appraisals, refresher trainings and supportive supervision are lacking. These problems are exacerbated by irregular disbursement of salaries, which adversely affects motivation levels and leads to underperformance among health care workers. In addition, stakeholders noted that rapid turnover of management in nutrition programs, exemplified by the recent newly appointed staff of the IRMNCH program in KP, hinders effective leadership.

A.6.3. Priority Actions for Food Security and Nutrition

This section presents recommended action items for improvements in food security and nutrition in KP. The first subsection relates to national recommendations that require provincial support. The next subsections present priority actions related to both food security and nutrition, followed by specific recommendations related to each topic separately.

A.6.3.1. National-level Recommendations that Need Provincial Support

The following general and overarching actions, highlighted in the main report, should be part of all programs or policy developments, and should be supported and implemented by stakeholders in KP:

- **Establish a nutrition and food security surveillance system**, in line with SDG targets and indicators, and ensure its data requirements are met. The NNS 2011, for example, missed nutritional data on adolescents due to over-reporting, poor recording, high refusal rates, low bioavailability due to dietary practices and interrupted/inadequate supply of supplements.
- **Create of a culture of monitoring, evaluation and research** that helps define how to implement and scale up potentially valuable programs.
- **Identify and empower female champions for change** at the household and community levels in all programs and implementation structures, including microfinance for women and interventions that bring positive change for women in the household power structure.

Additionally, a set of analyses, policies, and programs appropriate to most provinces and regions are presented in Chapter 5 and are summarized briefly here.

- **Evaluate current social protection programs** for potential coverage, costs and likely benefits, with nutrition sensitive components added whenever they can be effective. While universal social protection is perhaps a long-term goal, immediate challenges are to reach the urban poor and landless rural inhabitants. This review could examine if awareness programs within BISP, increasing payments, and graduation programs are effective to improve outcomes.
- **Finalize policies** under review at the national level **and implement them fully** through the provincial government and other stakeholders. These include a National Water Policy, which has been drafted; a National Seed Amendment that was passed in 2015; and a Plant Breeder Rights Act in 2016. The implementation of these policies has been slow.
- **Conduct comparative analysis of best approaches for BCC strategies** related to nutrition, particularly for breastfeeding campaigns, as current programs show little long-term effect. Analysis is needed of the value of broader nutrition campaigns and the potential use of community social structures for promoting nutrition knowledge. BCC strategies also should include mechanisms to sensitize males on women's health issues.
- **Review the role of BHUs and other locations for SNF delivery** (particularly since SNF programs are not a top option economically – (Shekar et al., 2016)); assess the feasibility of integrating CMAM programs into the community-based health care delivery system; and enhance capacity of LHWs and BHU doctors to screen for acute malnutrition.
- Assess the potential for schools to **add basic nutrition education and WASH concepts in teacher training programs,** and assess the expected nutritional impact of improving WASH facilities in

schools and other locations to identify those that are most cost-effective and have the highest impact on nutrition outcomes.

A.6.3.2. Priority Actions Related to Both Food Security and Nutrition

In this section, we offer recommendations related to both food security and nutrition in KP.

Further Improve Institutional Arrangements. The MSNS and associated institutional structures have been developed well in KP, with the strategy completed, cells created and integrated PC-1s put in place for funding. However, as these systems are new, they must be given time to bear results, and all interested stakeholders should observe and track this progress. Specific suggestions include the following:

- **Review proposed projects for gender-sensitive and nutrition-sensitive components**. The related nutrition cell in the provincial P&D department can take the lead. Conducting such reviews for all proposed projects would improve the gender and nutrition dimensions of projects implemented by all related departments.
- **Assess the administrative homes for MSNS**. In many respects, the location of the management of the MSNS in the P&D department is correct, given the multi sectoral dimensions of the strategy. Depending on outcomes after several years, however, in order to gain further political commitment for nutrition and food security, it might be advisable to move the administrative home of MSNS to the Chief Minister's office.
- **Assess the food security-related departments in the MSNS** to determine whether their structure is adequate.

Explore Funding Options. KP may spend more than PKR 18 billion each year on subsidies through wheat procurement, electricity for tube wells, fertilizer, and credit. (The costs of the irrigation system are over and above this amount.) The required funds for food security and nutrition initiatives can be found by diverting such subsidies to nutrition-focused and/or productivity-enhancing agricultural R&D, in part by better targeting of subsidy beneficiaries. In addition, imposing an agricultural income tax and revenues from sales of public research products can provide long-term support to the agricultural sector.

A.6.3.3. Priority Actions Specific to Food Security

This section presents action items specifically for improving food security in KP.

Improve Farm Service Centers. In KP, one of the main programs of assistance for famers has been the farm service centers, which are spread across the province and are supposed to be multipurpose agricultural extension systems and farmer field schools, with support facilities and technical capacity. However, so far these centers have mostly been used to distribute seed and fertilizer, and relatively little expertise has been developed or deployed. Analysis is needed to determine the most effective approaches to reach smaller farmers and to provide the technology transfer and capacity building that was originally envisioned. Progressively, the private sector should take over, but it needs to be determined when and in what areas.

Capitalize on Agricultural Production and Marketing Opportunities. The provincial consultations included spirited debate on ways to encourage agricultural marketing, and the kinds of opportunities that exist in KP due to its wide variety of growing conditions and agro-ecological zones. Some participants suggested that a detailed review is needed of the Swat Valley growers who switched from apples to peaches to adjust to changing demand. This shift required new skills, and grower associations played an important role. Also, the Swat Valley has an ongoing successful partnership among universities, the private sector and the government for the development and marketing of medicinal and aromatic plants. Assessments of the Swat Valley experiences could contribute to other improvements, such as enhancing the roles of traditional and small-scale processors; creating incentives to diversify; identifying innovative ways to improve food fortification and food safety regulation; facilitation of kitchen gardening and small-scale vegetable farming; and food handling training for farmers, especially women. While there are numerous options, one potential approach is to create an Agricultural Marketing Regulatory Authority to shift the government to a more regulatory role for agricultural marketing, and to encourage more engagement from the private sector, as is being attempted in Punjab.

Adopt and Enforce Relevant Policies. KP's agricultural policy needs effective implementing structures and associated PC-1s. It also requires establishment of an entity with the capacity to provide oversight for policy implementation, inclusion of the right composition of stakeholders, independence to act, and technical capacity to design associated legislation and supporting programs. The policy should facilitate an appropriate balance between food accessibility and availability, which is often not the case. In addition, KP has drafted a rangelands policy to improve the productivity and rehabilitation of the province's rangelands, and KP has supported an Integrated Natural Resource Management PC-1 to manage watersheds, forests and rangelands. This policy and the PC-1 are huge resources in KP and, if managed correctly, have the possibility to foster economic growth in the north of the province, which has implications for sustainability, productivity and accessibility for poor and unreached populations. The implementation of the rangelands policy needs to be tracked and supported.

Establish a Provincial Agricultural Research Board. KP has not adopted enabling legislation for a provincial agriculture research board. This board has the potential to link research institutions, extension workers, rural development associations and farmers, and to support public-private partnerships. The board would be an important addition to agricultural development approaches in the province.

Explore Other Suggestions. Many additional ideas were proposed during the consultations, including: Index-based crop and livestock insurance schemes; ICT-based mapping and zoning of agriculture; cluster-based approaches to agriculture; credit facilities; improved livestock vaccination systems through cold boxes; milk collection centers; and better genetic potential of indigenous.

A.6.3.4. Priority Actions Specific to Nutrition

Adopt and Enforce Relevant Policies. Recommended actions specific to nutrition in KP include adoption and enforcement of the following key policies to track, review and promote nutrition outcomes:

- *Protection of Breastfeeding and Child Nutrition Act.* This law was passed federally in 2002, but not endorsed by KP until 2014. The law must be translated into tangible implementation actions.
- *Salt Iodization Acts***.** KP has yet to enact legislation for iodization of salt, lagging behind other provinces.
- *Food Fortification Acts***.** Mostly donor-related efforts have been made for food fortification, particularly wheat flour, through GAIN and MI. Fortification of oil has been made mandatory through the Pure Food Rules of 1965. Enactment of legislation for both fortified oil and wheat flour is needed, with mechanisms to assure quality by food processors and encourage cost reductions.
- *Early Marriage Restraint Act***.** KP should pass legislation similar to that in Sindh to prohibit early marriage, before the age of 18, with severe penalties for any violation. During the consultations at KP, participant highlighted that 74% marriages in KP involve girls under the age of 18. So, Passage and strict enforcement of such a law would help ensure delays in marriage, thereby preventing adolescent mothers from entering the intergenerational cycle of stunting and poverty.

Improve Program Implementation. Research should inform the design of nutrition programs that are context appropriate, gain community acceptance, and meet actual community-level needs. Also needed are process evaluations and M&E systems with periodic cross-cutting reviews of funds, as well as measurable indicators and time-bound goals to create accountability. These systems will help determine feasibility and identify bottlenecks for full-scale implementation. A web-based knowledge management portal for nutrition should be considered, with all information accessible needs to promote lessons learnt, identify best practices, and avoid duplication of efforts.

KP improving integrated health facilities program focusing on CMAM in 23 districts. Also, established stabilization centers and trained staff. A program using CMAM interventions aimed at eliminating severe malnutrition in the three most afflicted districts (Peshawar, Swat and Charsadda), which is estimated to cost PKR 39600 per person (UNICEF, 2012), would cost a total of PKR 3.1 billion. If the next two districts (Mansehra and Kohistan) are included, the cost goes up to PKR 4.6 billion. Covering severely underweight children in the top 10 districts of KP would cost around PKR 7.7 billion. Ultimately, these costs could drop by using a lifecycle approach to nutrition, progressively seeing adolescents as the first point of intervention, followed by pregnant and lactating women, which is needed to stop the intergenerational transmission of poor growth and development in children. CMAM programs with built-in compliance monitoring at schools can be very effective. Furthermore, horizontal integration of such programs, supported by community mobilization, could help ensure that marginalized segments of the population are reached. The MSNS can link these programs with school monitoring.

The LHW program is a potential resource for identifying those at risk and integrating CMAM programs into the health care system. Enhancing the capacity of frontline health workers (LHWs CHWs, LHVs and Medical Officers at BHU/RHC) for screening for acute malnutrition, counseling parents and dispensing SNF can increase coverage and ensure effective treatment of SAM and MAM on an out-patient basis.

Develop Human Resources. We recommend creation of dedicated nutrition positions in programs and hiring of qualified nutrition experts. To achieve these goals requires long-term human resource

development initiatives. First, curricular standards and requisites on nutrition competencies need to be established and made a mandatory part of medical education and training as well other academic courses. Second, evaluations of existing nutrition-related community programs suggest a need for developing training curricula and conducting in-service refresher trainings. These suggestions should be extended to training teachers and cadres of the school health and nutrition supervisors. Third, development of transparent and robust performance evaluation systems with key performance indicators in the health care system is essential to improve individual performances and consequently organizational performance.

Increase Awareness on Nutrition. To help ensure nutrition messages reach all segments of the population, we recommend dissemination of these messages through various media, including cooking shows. followed by hands on counseling on key topics such a recommended IYCF practices, low cost high nutritional value meal planning, complementary proteins, portion sizes, carbohydrate counting etc. by trained health care workers can ensure messages reach all segments of the population.

Appendix 7: Situation and Gap Analysis for Punjab, with Proposed Priority Actions

The Food Security and Nutrition Strategic Review is an independent, analytical and consultative exercise designed to identify the key challenges faced by Pakistan in achieving food security and improved nutrition, and to provide prioritized areas for action for the Government of Pakistan and all development partners. In an effort to make the review an inclusionary process and better understand implementation efforts, the technical team from IFPRI and AKU held two consultative workshops in each province and region.

Facilitated by the Punjab Planning and Development Department, the consultative workshops held in Lahore, Punjab, were widely attended by members of government, local NGOs and United Nations officials. On February 2, 2017, the technical team also re-visited Lahore to present their conclusions to a similar stakeholder group. Additionally, on October 27 and 28, 2016, members of the AKU and IFPRI teams visited seven departments in Punjab associated with the Multi-Sector Nutrition Strategy.

In the first section of this appendix, we review the status of nutrition and food security in Punjab, beginning with an assessment of the nutritional status of children and its immediate and underlying determinants. This approach follows the structure in Chapter 3 in the main report, but focuses on the specific context of Punjab. The second section of this appendix presents gaps related to food security and nutrition, including gaps in food availability, food accessibility, WASH issues and policy, following the structure in Chapter 4. The third section of this appendix recommends a set of priority actions for Punjab, which follows the structure in Chapters 4 and 5 of the main report.

A.7.1. Nutritional and Food Security Status in Punjab

The main goal of this Strategic Review is to inform the government and stakeholders about the situation, gaps and recommendations related to improving nutrition and food security. The starting point is to assess nutritional status as reported in the UNICEF framework for children. We then look at the immediate determinants, including dietary intake and maternal health status. We broaden the review by looking at the underlying determinants of the nutritional status, including especially issues related to food insecurity.

A.7.1.1. Nutritional Status of Children

As the “bread basket” of the country (producing three-quarters of the nation’s grain), Punjab has always been ahead of other regions, with the strongest nutrition indicators. Nevertheless, Table A.7-1 shows the main consequences for children from malnutrition, as reported in different data sources. Depending on the survey used, under-nutrition in the province is just marginally lower or higher than the national average, but there are disparities within the province, particularly in southern Punjab, where 52.9% of children under five are undernourished, compared to 29.8% overall (MICS-Punjab, 2014). The level of stunting in the whole province is about 5% lower than the overall Pakistan value, when comparing the

two NNS 2011 values, and percentages of underweight and wasting are about the same. The IMR and under five mortality also are similar to the national average, comparing MICS 2011 and PDHS 2007 data.

Table A.7-1: Anthropometrics/Mortality of Children Under Five in Punjab

	Punjab			Pakistan		
	MICS 2011	NNS 2011	MICS 2014	NNS 2001	NNS 2011	PDHS 2013
Underweight	33	30	34	41.5	32	30
Stunting	36	39	34	31	44	45
Wasting	16	14	18	12	15	11
Infant Mortality	82	-	75	-	*78	74
Under Five Mortality	104	-	93	-	*94	89

Note: * Data from PDHS 2007

The time path of stunting, wasting and underweight proportions is instructive to view to show challenges that arise when attempting to improve children's nutrition. The national situation derived from the PDHS 2013 shows that 26% of children are stunted *at birth*, more than 30% are wasted, and about 20% are underweight. Compromised maternal nutrition along with poor IYCF practices leads to increased children's malnourishment from 6 months until 23 months, so that 50% of children are stunted, while wasting declines to 10%. The underweight prevalence worsens to about 30% at two years of age, but stays around the same average afterwards. After two years, the increase in stunting still occurs, but at a much lower rate, as seen in Figure A.7-1. Data specifically for Punjab is presented in Figure A.7-2.

Figure A.7-1: Nutrition Status of Children by Age, PDHS, 2013

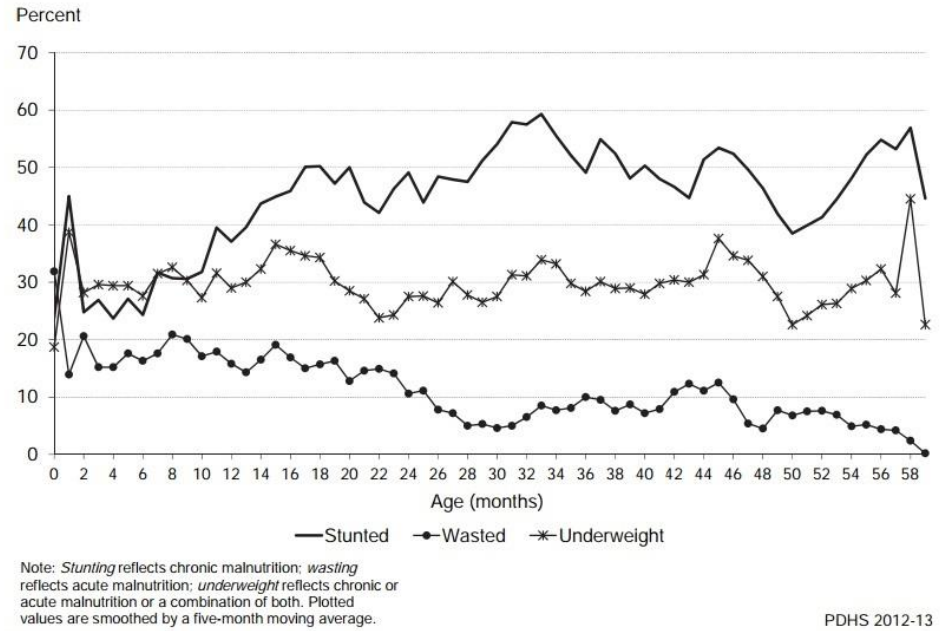
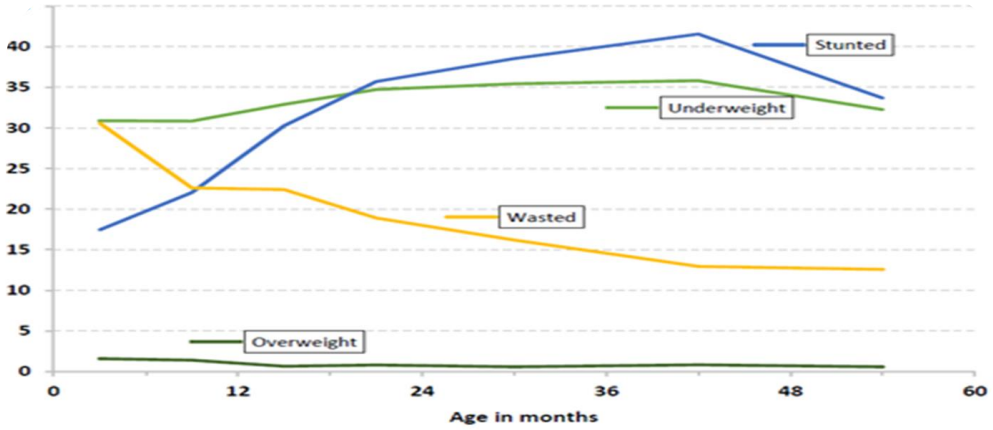


Figure A.7-2: Nutrition Status of Children by Age in Punjab (MICS-Punjab, 2014)



Additionally, severe micronutrient deficiencies exist among children, with vitamin A most prevalent among children under five. As shown in Table A.7-2, 51% of children in Punjab are vitamin A deficient, 49% are iron deficient, 38% are zinc deficient and 40% are vitamin D deficient. In the absence of adequate dietary practices, micronutrients requirements must be met with supplements. The PDHS 2013 notes that only 8.8% children aged 6-59 months received iron supplements in the last 7 days. Vitamin A supplementation was better, as 78% of children received a dose within 6 months. Malnourished children have higher risk of morbidity (both infectious and non-communicable diseases) and mortality. Moreover, these children have lower IQ and poor educational performance, physical growth and development (Victora and Rivera, 2014). Therefore, the role of nutrition, combined with proper IYCF practices, is crucially important.

Table A.7-2: Micronutrient Deficiencies in Children Under Five in Punjab

	Punjab			Pakistan		
	MICS 2011	NNS 2011	MICS 2014	NNS 2001	NNS 2011	PDHS 2013
Vitamin A	-	51	-	13	54	-
Iron	-	49	-	67	33	-
Zinc	-	38	-	37	39	-
Vitamin D	-	40	-	-	40	-

One of the most common practices in Punjab, which marks the beginning of IYCF, is the concept of pre-lacteal feeding, which is practiced by 83.6% of mothers. Research finds that pre-lacteal feeding is major barrier to early initiation of and exclusive breastfeeding and increases the risk of infections. Such a high proportion of pre-lacteal feeding is reflected in low early initiation rates of breastfeeding (10%) and low exclusive breastfeeding rates (8%). Bottle feeding has also risen, with 57.7% of children being bottle fed in 2014. The MICS-Punjab (2014) shows that 39% of children are not introduced to semi-solid or solid foods at an appropriate age of 6-8 months.

From 2013 to 2014, the province saw a drop in children with a MAD, from 14.2% to 9.7%, while the proportion of children being fed four or more food groups dropped from 22.2% to 17.3%. Only 65.3% children were fed the recommended minimum meal frequency. The combined prevalence of all three recommended IYCF practices (MAD, Minimum Meal Frequency and intake of breast milk and milk products) is only 14% for children 6-23 months in Punjab. Despite evidence showing that nutritional status improves with increasing access to education, WASH and higher socioeconomic status (which are typically more prevalent in urban areas), urban children in Punjab are only marginally better than rural children, as documented in the Nutrition in the Cities report by WFP (GoP and WFP, 2016a).

A.7.1.2. Immediate Determinants

The children's nutrition status presented above is affected by two immediate factors, including the mother's health status and the dietary intake within the family and by a child. These are discussed below.

Maternal Health Status. A mother's health status is an important determinant of children's health at birth and thereafter. Limited maternal nutrient reserves lead to intrauterine growth retardation, as 80% of an infant's iron and zinc stores are accumulated in the last trimester of pregnancy. Furthermore, compromised maternal nutrition affects the composition of breast milk, as many nutrients are secreted in human milk at the expense of maternal reserves, especially micronutrients such as vitamins B_6, B_{12}, A, and D. This link is reflected in the malnutrition indicators for Punjab, with 17.5% children already stunted, 31% wasted and 31% underweight by the age of 6 months (MICS-Punjab, 2014). Widespread micronutrient deficiencies are found among pregnant and non-pregnant women across Punjab (NNS, 2011), with vitamin D deficiency most prevalent. Table A.7-3 shows some differences in micronutrient deficiency levels between non-pregnant and pregnant women, especially for iron. These deficiencies can translate into growth problems in unborn children. Comparing the Punjab situation with Pakistan NNS 2011, a slight decrease in underweight prevalence occurred with increased overweight and obesity, raising the double burden of disease.

Table A.7-3: Maternal Micronutrient Deficiencies in Punjab

	Vitamin A (Both Severe and Moderate)		Vitamin D		Iron		Zinc	
	Pregnant Women (%)	Non-Pregnant Women (%)	Pregnant Women (%)	Non-Pregnant Women (%)	Pregnant Women (%)	Non-Pregnant Women (%)	Pregnant Women (%)	Non-Pregnant Women (%)
Pakistan NNS - 2001	-	6	-	-	-	45	-	46
Pakistan NNS-2011	46	42	69	67	25	19	48	41
Punjab NNS-2011	44	42	71	66	39	27	47	40

Dietary Intake. The prevalence of undernourishment in Punjab is lower than the national average (14%), as is the ratio of households in Punjab (37%) with average food consumption lower than 2,350 kcal per adult equivalent per day. However, the average caloric intake in three of the nine divisions in Punjab

(D.G. Khan, Multan, Gujranwala) is below the recommended daily intake, and the prevalence of undernourishment in these divisions is above the national average.

Despite general availability of nutritious foods in markets and the high levels of urbanization in the province, Household Dietary Diversity Scores reveal that 35% of households consume from fewer than five food groups, and food consumption scores show that only a small proportion of women (5%) and children (4%) are able to attain minimum dietary diversity. About two-thirds of households are below the staple adjusted nutrient threshold (GoP and WFP, 2016a; GoP,2017). Moreover, data show that a high proportion of total food expenditure goes to wheat, oil, fats and sugar, which are energy dense but of low nutritional value, thus making the lack of dietary diversity more problematic. Resultant food-based micronutrient inadequacies include vitamin A (67%), iron (58%), zinc (29%) and protein (23%), as shown in Table A.7-4 (GoP, 2017).

Table A.7-4: Inadequacies in Caloric and Micronutrient Intake in Punjab (GoP, 2017)

	Diet Quantity			Under-nutrition			
				% of HH with food based micro-nutrient deficiencies			
	Average per capita kcal consumption	% of HH below 2350 kcal per adult equivalent per day	Prevalence of under-nourishment (PoU)	Protein	Vitamin-A	Iron	Zinc
Pakistan	2,360	44	18	32	77	68	40
Punjab	2,485	37	14	23	67	58	29
D G Khan	2,284	48	35	26	78	59	69
Gujranwala	2,251	51	26	30	72	76	15
Lahore	2,670	25	9	15	54	57	50
Multan	2,164	54	27	31	82	71	18
Rawalpindi	2,484	34	16	22	74	60	46
Sahiwal	2,622	32	10	26	61	52	13
Sargodha	2,630	28	7	17	72	46	38
Bahawalpur	2,621	23	8	21	60	50	20
Faisalabad	2,722	29	9	15	55	43	3

A.7.1.3. Underlying Determinants

In this section, important underlying determinants are reported, including availability and accessibility of food, WASH factors and the role of selected policies.

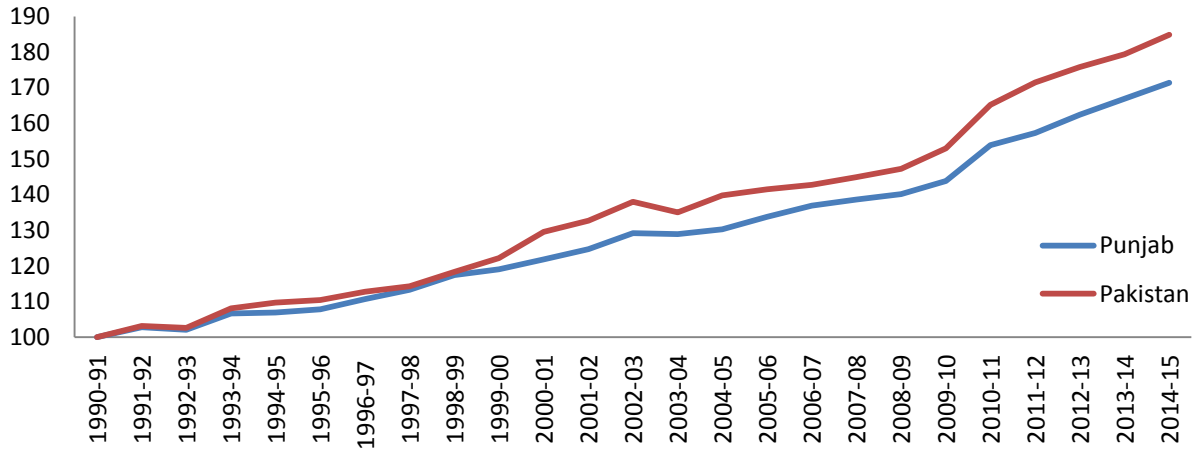
Food Availability. During the last 25 years in Punjab, the needed production on each acre of land has grown consistently, as the population to be supported increased by 71% from 1990 to 2014 relatively lower than Pakistan; it grew by 85% (GoP, 2014b). However, the persons to be supported on each acre are expected to increase by 98% from 1990 to 2030. For long run sustainable production, the output per unit of land should keep up with population growth, but, as Figure A.7-3 shows, it has lagged.

Food Availability. During the last 25 years in Punjab, crop yields per acre of land had to increase by 71% to maintain the same per capita food availability over time (GoP, 2014b), which is lower than the

required national increase of 85%, as Figure A.7-3 shows. The population to be supported on each acre is expected to further increase by 27% from 2015 to 2030. However, Table A.7-5 shows that only growth in maize yield (4.6%) kept up with the provincial population growth (2.4%). Importantly, the increase in wheat production (1.7%) did not keep up with population growth. In fact, per capita domestic wheat production has declined by 0.3% since 1986. Punjab is self-sufficient in wheat production and provided 80% of the nation's production in 2015-16, but the rising population is a serious concern (GoP, 2016b).

Punjab also is the leading producer of pulses, as nearly 82% of the country's total production comes from this province (GoP, 2016b); consequently, growth in pulse yields has increased by 1.2%. However, Per capita production of pulses and fruits has declined by 3.4% and 0.6%, while rice and vegetables have increased by 0.5% and 1.3%, respectively. While it is possible to rely on imports rather than domestic production, unlocking productivity in agriculture is essential to reduce the cost of a nutritious diet, to allow labor to transition into industry and higher-level services, and to permit scarce government revenues, currently used for subsidies, to be shifted to higher payoff uses.

Figure A.7-3: Population Pressure on Cultivated Land in Punjab



Source: Agriculture Statistics of Pakistan (Various Issues) and Population Estimates from Population Census, 1998.

Table A.7-5: Crop Yield and Population Growth Rates in Punjab

	Wheat	Rice	Maize	Sugarcane	Pulses	Vegetables	Fruits	Population*
Punjab	1.7	1.1	4.6	1.3	1.2	1.0	1.0	2.4
Pakistan	1.5	1.3	1.9	0.6	0.6	0.7	-0.6	2.3

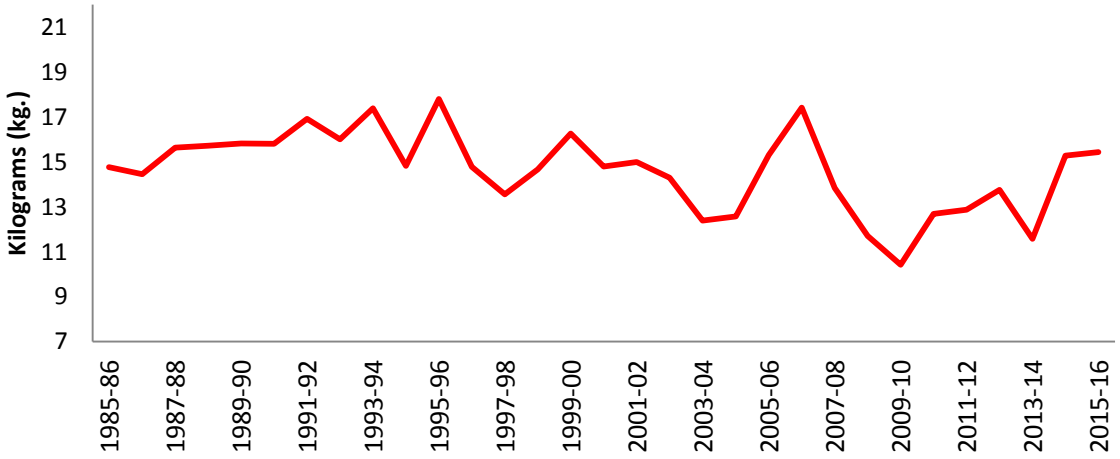
Source: Agriculture Statistics (Various Issues) and Economic Survey of Pakistan, 2013-14

* The 34-year population and crop yields growth rate from 1981 to 2014 is sourced from Economic Survey of Pakistan, 2015-16 and Agriculture Statistics of Pakistan (Various Issues).

Food Accessibility. Though Punjab performs better on the MPI compared to other regions, and has also recorded the highest reduction in poverty, 31.4% of its population is still deprived in health, education, and basic standards of living (GoP, 2016a). In addition, two out of every three households are unable to afford a balanced (staple adjusted) nutritious diet given their current food expenditures, despite the fact that the diet's cost is lowest in Punjab (GoP and WFP, 2016a).

Household real incomes in Punjab have gone up since 2001, but the average income growth rate has been as much as three times higher for the top quintile compared to the bottom quintile in urban areas (GoP, 2014a). With regard to daily wages, while the nominal daily wage of unskilled labor in Lahore more than tripled between 2004-05 and 2015-16, there were large fluctuations in food affordability due to the year-to-year price volatility, as shown in Figure A.7-4. An unskilled laborer in Lahore could afford 17.4 kilograms of wheat with his/her daily wage in 2006-07, but could only afford about 10.4 kg in 2009-10 (GoP, 2016b).

Figure A.7-4: Kilogram of Wheat Flour Affordable per One Day's Wages in Lahore



Source: Economic Survey of Pakistan (Various Issues)

On the physical accessibility front, Punjab has made significant improvements over the past five decades in terms of expansion of roads, transportation and communication. Nearly 80% of the population lives within three hours of a major city, and more than 90% of villages are now electrified. The rate of urbanization in Punjab is 2.9%, as compared to the national average of 3.6%.

WASH Issues. WASH issues are closely related to food accessibility and nutrition. Almost 62% of the population of Punjab has access to both improved (mostly covered) water sources and improved sanitation facilities (Kedir Schmidt, and Waqas, 2016; PRHPS, 2017; MICS, 2014). However 17.5% of the population in Punjab still practices open defecation, and the percentage is as high as 41% in D.G. Khan (MICS, 2014). Availability of infrastructure and sanitation facilities in schools are better than in other regions at 93%, although districts from southern Punjab (D.G. Khan, Muzaffargarh, and Rajanpur) lag (Alif Ailaan, 2016).

Policies. Significant steps have been taken in drafting nutrition-support and food security policies in Punjab, particularly since the 2010 floods and the federal establishment of the PINS. Some additional major policies are in drafting stage. The draft of Punjab Sanitation Policy awaits approval, while initial discussions on the Punjab Agriculture Policy have begun. The status of several relevant Punjab laws and policies is summarized in Table A.7-6.

A.7.2. Gaps in Food Security and Nutrition

The three days of provincial consultations along with an in-depth desk review highlighted a series of gaps and challenges hindering progress in achieving food and nutrition security in Punjab. These gaps are presented in three subsections below. The first subsection indicates gaps related to both nutrition and food security. The next subsections present gaps specific to food security, followed by nutrition.

Table A.7-6: Polices in Punjab

Policy	Year	Details
Protection of Breastfeeding and Child Nutrition Act	2002	Endorsed by Punjab in 2012
Punjab Food Authority Act	2011	An Act to provide for the safety and standards of food and for establishment of the Punjab Food Authority
Punjab Drinking Water Policy	2011	An Act to provide for the safe drinking water and institutional reforms.
Multi-sectoral Nutrition Strategy/ PC-1	2015	Drafted and approved within the scope of Pakistan Vision 2025
Punjab Pure Food (Amendment) Ordinance	2015	To amend the Punjab Food Authority Act 2011, for categorization of food business premises and enhancing punishments and other purposes
Punjab Livestock Policy	2015	Implementation Phase
Punjab Pure Food (Amendment) Act	2016	Act amended to include food fortification
Punjab Land Records Authority Act	2017	Pilot project implemented in Kasur District
National Water Policy		Approved by Inter Provincial Coordination Ministry in January 2017, and awaiting CCI approval.
The IDD Control Bill		Drafted in 2009 but not passed. As of 2015, Punjab has compulsory iodization of salt, but the implementation is poor.

A.7.2.1. Gaps Related to Both Food Security and Nutrition

Policy and Governance Gaps. Most relevant policies in the Punjab are very recent and need time to have impact. The Protection of Breastfeeding and Child Nutrition Ordinance was passed nationally in 2002, and adopted 10 years later in Punjab, along with the corresponding Rules and notification of the Punjab Infant Feeding Board. Despite these efforts, exclusive breastfeeding rates remain low, while early initiation of breastfeeding has declined. Other examples include the enactment of the Compulsory Salt Iodization Act, 2015, and the Punjab Pure Food Rules, and establishment of a functional Food Authority. These policies nevertheless were followed by lapses in quality of iodized salt and widespread poor food quality.

Writing a policy does not ensure impact. For any policy to be successful, adequate funding is needed, as is a structure to mobilize, evaluate, and redirect funds. Additional challenges for policy implementation include the need for technical human resources and systems for monitoring and evaluation; making sure that diverse stakeholders are included; and securing investments from the private sector.

Funding Gaps. Stakeholders in Punjab consultation meetings raised as a major concern the limited funding from government and reliance on donors for nutrition-specific and nutrition-sensitive programs. For example, the World Bank allocated a fund of PKR 4 billion for implementation of the PC-1 for

nutrition, with minimal contribution from the government. Other concerns regarding funding modalities included the population-based distribution formula, which led to inequitable funding allocations, depriving districts most in need, particularly in south Punjab. Agricultural subsidies were over PKR 100 billion in Punjab, but much of these funds could go to better uses in nutrition or productivity-enhancing investments.

Accessibility Gaps. Despite an adequate food supply in Punjab, a lack of affordability hinders food security. Real incomes in the lowest quintile have risen at a much slower rate than incomes in the highest quintiles, so a balanced diet remains out of the reach of almost 70% of rural households, given their current food expenditures (GOP and WFP, 2016a). Any economic growth in Punjab has not been inclusive or equitable. As in most of rural Pakistan, a lack of rural non-farm employment opportunities in the province, and the resultant urban migration, poses a serious concern for the already difficult food security situation.

In the absence of affordability, social protection plays a key role. While many social protection programs[38] are underway, they clearly fall short, as only 7.2% households in Punjab reported benefiting from provincial government social protection schemes, most of which were concentrated in rural areas. A higher percentage of households are benefiting from utility stores, but surprisingly the beneficiaries include only 6% of the poorest households as compared to 33% of the wealthiest households (MICS-Punjab, 2014). Notably, the correlation between the PoU and the use of utility stores was negative in Punjab, suggesting that these outlets on average serve relatively wealthier customers, and the rural landless and urban poor are underserved. While many efforts to reach the rural landless are underway, such as distribution of livestock units, and the Multidimensional Poverty Index reveals an increase in access to land and livestock (albeit only 3% between 2004 and 2014), the long-run sustainability of such programs is uncertain.

A.7.2.2. Gaps Specific to Food Security

Availability Gaps. Possibly the most critical issue for food availability in Punjab is the increasing number of farms with less than five acres of land, which makes agricultural productivity highly challenging. Figure A.7-5 shows the change over time in the percentage of farms of various sizes. In 1990, fewer than half (45%) of farms in Punjab were less than five acres in size, but as of 2010 about 64% of farms are in this smallest category. Most of the small farm acreage is coming from fragmentation of mid-sized farms, which fall in the small commercial farmer category. (In 1990, there were about 3 million farms in Punjab; this number grew to 5.2 million in 2010 due to fragmentation.) This fragmentation is a concern because small commercial farmers have a significant role in productivity growth and poverty reduction. (See Chapter 4 for a detailed discussion on work by Mellor and Malik, 2017.)

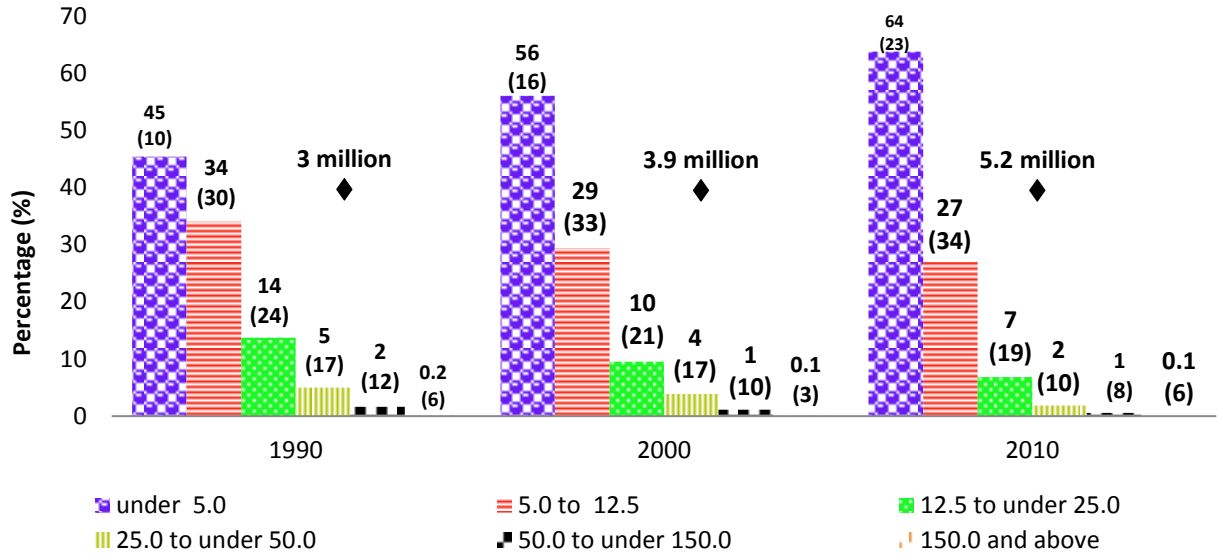
For sustained agricultural production, traditional inputs cannot be the engines of growth, as land, tube wells, water, and even fertilizer and tractors have reached their maximum contribution. The use of indigenous improved seed is not only costly, but is often unavailable, and inconsistent in quality. In

[38] For this provincial discussion, we do not address national social protection programs, such as the BISP, as the gaps and recommendations are similar across provinces and have already been covered in the main report.

addition, commercialization in seed industry, which creates issues of quality seed, truth in labeling of seed bags and high seed prices, could halt farmer's purchasing power. With the growing number of small farms and input use saturation, advancements in agricultural R&D are crucial, but spending on R&D remains low in Punjab, as in the rest of the country.

Other issues in agriculture in Punjab include a lack of focus on surface water harvesting and water rights for farmers located at tail, lack of effective extension services and operational capacity of extension department, and lack of knowledge about best practices in agriculture Other issues, such as those pertaining to climate change and weak marketing and distribution systems are discussed in detail in Chapter 4 and do not vary significantly by province.

Figure A.7-5: Declining Farm Size over Time in Punjab, in Acres



Source: Agriculture Census (Various Issues)
Note: Numbers in parentheses show percentage of total acreage

A.7.2.3. Gaps Specific to Nutrition

Absence of Nutrition-sensitive Schemes for WASH. A recent analysis suggests that only about one-quarter of stunting could be alleviated by nutrition-specific interventions alone, which indicates that the potential role of WASH might be significant (Bhutta et al., 2013). Punjab has made good progress in increasing access to improved drinking water sources (94%), which has a range of benefits, including time and energy savings for women and children, and lower diarrhea prevalence (Cumming and Cairncross, 2016). However, the majority of households do not treat water, and poor water quality is particularly an issue in urban areas. In addition, while 75% of households have access to sanitation facilities, 18% still defecate openly, and sub-optimal WASH conditions in schools adversely affect the nutritional status of children. These factors contribute to school absenteeism and high drop-out rates, especially among girls during menstruation.[39] School drop-out rates among girls are associated with

[39] http://documents.worldbank.org/curated/en/576391490881393712/pdf/113884-WP-PUBLIC-ADD-SERIES-Water-and-sanitation-program.pdf

early marriages and motherhood in adolescence, thus initiating an intergenerational cycle of stunting and poverty. Creative solutions are needed for WASH investments that help nutrition.

Program Implementation Gaps. CMAM programs are confined to limited districts within Punjab and have patchy coverage and no link with mainstream government programs or the health care system. In remote districts, the availability of human resources to deliver the program is an issue, and referral rates remain low. In addition, CMAM is cost-intensive when imports of RUTF are used, before local alternatives are devised. Despite varying models of school health programs being implemented, little progress has been seen in health indicators or adoption of health seeking behaviors, so a successful and sustainable model with a nutrition package is yet to be developed. Among the nine districts in the MICS 2014 for Punjab, the three with the highest estimated number of severely underweight children are Faisalabad (about 100,000 children), followed by Multan and Lahore (between 62,000 and 65,000 children each). Together, these three districts cover over 48% of the SAM-afflicted children.

Stakeholders in Punjab highlighted as a challenge the limited coverage by LHWs, particularly in suburbs and slums. LHWs have just 52% coverage in southern Punjab, versus 75% coverage in central Punjab. In addition, integration of LHW services with BHUs is uneven due to weak referral systems. Other issues included weak logistics and lack of separate adult and baby weighing scales. Moreover, process evaluations during programs and impact evaluation after programs are limited. Those programs that were evaluated did not effectively embed findings in scaling-up plans.

Lack of Awareness on Nutrition. The literature consistently suggests that education and nutritional awareness among women plays a vital role in determining the dietary practices of households. Data from a plethora of nutrition-focused surveys confirms that nutrition indicators improve with increasing maternal educational levels, as well as wealth quintiles. Low literacy levels coupled with media influences and cultural beliefs/taboos (such as beliefs that fortification/polio vaccines cause impotency, or that hot and cold foods should be consumed for certain illnesses) adversely affect dietary practices. The situation is amplified by an absence of nutrition concepts in school curricula and teacher induction programs. During the consultations, participants expressed a common concern that most nutrition programs lack effective BCC strategies, contributing to low exclusive breastfeeding rates (8%) and high pre-lacteal feeding (83.6%). Community mobilization also is limited when designing nutrition interventions.

Human Resource Gaps. To achieve improved nutrition in Punjab, the health care system as well as the development sector should have human resources with credible nutrition expertise. At present, there is limited capacity among existing health care providers in nutrition, and a dearth of nutrition experts in the development sector. One reason is that nutrition is not given enough emphasis in medical curricula and in-service training. Stakeholders pointed out that performance appraisals, refresher trainings and supportive supervision are lacking. These problems are exacerbated by irregular disbursement of salaries, which adversely affects motivation levels and leads to underperformance among health care workers. In addition, stakeholders noted that rapid turnover of management in nutrition programs hinders effective leadership.

A.7.3. Priority Actions for Food Security and Nutrition

This section presents recommended action items for improvements in food security and nutrition in Punjab. The first subsection relates to national recommendations that require provincial support. The next subsections present priority actions related to both food security and nutrition, followed by specific recommendations related to each topic separately.

A.7.3.1. National-level Recommendations that Need Provincial Support

The following general and overarching actions, highlighted in the main report, should be part of all programs or policy developments, and should be supported and implemented by stakeholders in Punjab:

- **Establish a nutrition and food security surveillance system**, in line with SDG targets and indicators, and ensure its data requirements are met. The NNS 2011 and MICS 2014, for example, missed nutritional data on adolescents due to over-reporting, poor recording, high refusal rates, low bioavailability due to dietary practices and interrupted/inadequate supply of supplements.
- **Create of a culture of monitoring, evaluation and research** that helps define how to implement and scale up potentially valuable programs.
- **Identify and empower female champions for change** at the household and community levels in all programs and implementation structures, including microfinance for women and interventions that bring positive change for women in the household power structure.

Additionally, a set of analyses, policies, and programs appropriate to most provinces and regions are presented in Chapter 5 and are summarized briefly here.

- **Evaluate current social protection programs** for potential coverage, costs and likely benefits, with nutrition sensitive components added whenever they can be effective. While universal social protection is perhaps a long-term goal, immediate challenges are to reach the urban poor and landless rural inhabitants. This review could examine if awareness programs within BISP, increasing payments, and graduation programs are effective to improve outcomes.
- **Finalize policies** under review at the national level **and implement them fully** through the provincial government and other stakeholders. These include a National Water Policy, which has been drafted; a National Seed Amendment that was passed in 2015; and a Plant Breeder Rights Act in 2016. The implementation of these policies has been slow.
- **Conduct comparative analysis of best approaches for BCC strategies** related to nutrition, particularly for breastfeeding campaigns, as current programs show little long-term effect. Analysis is needed of the value of broader nutrition campaigns and the potential use of community social structures for promoting nutrition knowledge. BCC strategies also should include mechanisms to sensitize males on women's health issues.
- **Review the role of BHUs and other locations for SNF delivery** (particularly since SNF programs are not a top option economically – (Shekar et. al., 2016)); assess the feasibility of integrating CMAM programs into the community-based health care delivery system; and enhance capacity of LHWs and BHU doctors to screen for acute malnutrition.

- Assess the potential for schools to **add basic nutrition education and WASH concepts in teacher training programs,** and assess the expected nutritional impact of improving WASH facilities in schools and other locations to identify those that are most cost-effective and have the highest impact on nutrition outcomes.

A.7.3.2. Priority Actions Related to Both Food Security and Nutrition

In this section, we offer recommendations related to both food security and nutrition in Punjab.

Further Improve Institutional Arrangements. The MSNS and associated institutional structures have been developed well in Punjab, with the strategy completed, cells created and integrated PC-1s put in place for funding. However, as these systems are new, they must be given time to bear results, and all interested stakeholders should observe and track this progress. Specific suggestions include the following:

- **Review proposed projects for gender-sensitive and nutrition-sensitive components**. The related nutrition cell in the provincial P&D department can take the lead. Conducting such reviews for all proposed projects would improve the gender and nutrition dimensions of projects implemented by all related departments.
- **Assess the administrative homes for MSNS**. In many respects, the location of the management of the MSNS in the P&D department is correct, given the multi sectoral dimensions of the strategy. Depending on outcomes after several years, however, in order to gain further political commitment for nutrition and food security, it might be advisable to move the administrative home of MSNS to the Chief Minister's office.
- **Assess the food security-related departments in the MSNS** to determine whether their structure is adequate.

Explore Funding Options. Punjab spends more than PKR 100 billion each year on subsidies through wheat procurement, electricity for tube wells, fertilizer, and credit. (The costs of the irrigation system are over and above this amount.) The required funds for food security and nutrition initiatives can be found by diverting such subsidies to nutrition-focused and/or productivity-enhancing agricultural R&D, in part by better targeting of subsidy beneficiaries. In addition, imposing an agricultural income tax and revenues from sales of public research products can provide long-term support to the agricultural sector. This funding potential is high, since Punjab has an existing agricultural research system and Agricultural Research Board.

A.7.3.3. Priority Actions Specific to Food Security

This section presents action items specifically for improving food security in Punjab.

Capitalize on Agricultural Production and Marketing Opportunities. The Punjab Department of Cooperatives and a significant initiative in market reform (discussed below) are engaging the private sector. Additionally, Punjab has large veterinary and other extension programs and departments. Analysis is needed about how these resources can contribute to the most effective approaches to reach

smaller farmers, who have the largest potential impact on food security. Progressively, the private sector should take over, but it needs to be determined when and in what areas.

The Punjab government is undertaking several important activities to reform the agricultural marketing system. One initiative is the establishment of Punjab Agricultural Marketing Regulatory Authority (PAMRA) designed to shift the government to a more regulatory role for agricultural marketing and to encourage greater engagement by the private sector, including through changes related to market committees and wholesalers. As part of this process, public-private partnerships are needed to encourage nutrition-sensitive agriculture and a safe and nutritious food supply. Some important themes for consideration include enhancing the roles of traditional and small-scale processors; creating incentives to diversify; identifying innovative ways to improve food fortification and food safety regulation; storage facilities for facilitation of kitchen gardening and small-scale vegetable farming; and food handling training for farmers, especially women.

Adopt and Enforce Relevant Policies. Punjab has an agricultural policy under development, with an Agricultural Commission established to ensure that the policy is developed and followed through to implementation. It is important that the Commission, chaired by the Chief Minister of the Punjab, should have the capacity to provide oversight for policy implementation, the right composition of stakeholders included, independence to act, and technical capacity to design associated legislation and supporting programs. The policy needs to be finalized and should facilitate an appropriate balance between accessibility and availability, which is often not the case. The policy also needs effective implementing structures and associated PC-1s.

Enhance Agricultural Research. Punjab has the most developed provincial agriculture research board, with over five years of programming experience. This board has the potential to link research institutions, extension workers, rural development associations and farmers, and to support public-private partnerships. The research program should include nonagricultural science activities (beyond biology, plant science and animal breeding, etc.) and should reach out beyond the public sector research institutions and universities.

Explore Other Suggestions. Many additional ideas were proposed during the consultations, including: Index-based crop and livestock insurance schemes; ICT-based mapping and zoning of agriculture; cluster-based approaches to agriculture; credit facilities; improved livestock vaccination systems through cold boxes; milk collection centers; and better genetic potential of indigenous livestock.

A.7.3.4. Priority Actions Specific to Nutrition

Adopt and Enforce Relevant Policies. Recommended actions specific to nutrition in Punjab include adoption and enforcement of the following key policies to track, review and promote nutrition outcomes:

- *Protection of Breastfeeding and Child Nutrition Act.* This law was passed federally in 2002, but not endorsed by Punjab until 2012. The law must be translated into tangible implementation actions.
- *Salt Iodization Acts***.** Punjab adopted salt iodization in 2015, but implementation of this policy is poor. Development of strategies to ensure successful implementation are necessary.

- *Food Fortification Acts*. Mostly donor-related efforts have been made for food fortification, through GAIN and MI, and Punjab mandated wheat flour fortification in 2014. Legislation for fortified oil is needed, with mechanisms for quality assurance and cost reductions by food processors.
- *Early Marriage Restraint Act*. The Punjab Marriage Restraint (Amendment) Act, 2015, prohibits marriage of a male before the age of 18 and a female before the age of 16. The law includes penalties for violations committed by grooms, parents or marriage registrars, but the law is not well-enforced. Amendment of this law to prevent marriage by females before the age of 18, as in Sindh, combined with strict enforcement of the law, would help ensure delays in marriage, thereby preventing adolescent mothers from entering the intergenerational cycle of stunting and poverty.

Improve Program Implementation. Research should inform the design of nutrition programs that are context appropriate, gain community acceptance, and meet actual community-level needs. Also needed are process evaluations and M&E systems with periodic cross-cutting reviews of funds, as well as measurable indicators and time-bound goals to create accountability. These systems will help determine feasibility and identify bottlenecks for full-scale implementation. A web-based knowledge management portal for nutrition should be considered, with all information accessible needs to promote lessons learnt, identify best practices, and avoid duplication of efforts.

A CMAM program aimed at eliminating severe malnutrition in the three districts with the highest number of severely underweight children (Faisalabad, Multan and Lahore) using the full range of CMAM intervention (estimated to cost PKR 39,600 per person- UNICEF, 2012) would cost a total of PKR 9.1 billion. If the next two districts with the highest number of severely underweight children (Bahawalpur and D.G. Khan) are included, the cost goes up to PKR 13.7 billion. Covering severely underweight children in all nine MICS districts would cost PKR 18.7 billion. Ultimately, these costs could drop by using a lifecycle approach to nutrition, progressively seeing adolescents as the first point of intervention, followed by pregnant and lactating women, which is needed to stop the intergenerational transmission of poor growth and development in children. CMAM programs with built-in compliance monitoring at schools can be very effective. Furthermore, horizontal integration of such programs, supported by community mobilization, could help ensure that marginalized segments of the population are reached. The MSNS can link these programs with school monitoring.

The LHW program is a potential resource for identifying those at risk and integrating CMAM programs into the health care system. Enhancing the capacity of frontline health workers (LHWs CHWs, LHVs and Medical Officers at BHU/RHC) for screening for acute malnutrition, counseling parents and dispensing SNF can increase coverage and ensure effective treatment of SAM and MAM on an out-patient basis.

Develop Human Resources. We recommend creation of dedicated nutrition positions in programs and hiring of qualified nutrition experts. To achieve these goals requires long-term human resource development initiatives. First, curricular standards and requisites on nutrition competencies need to be established and made a mandatory part of medical education and training as well other academic courses. Second, evaluations of existing nutrition-related community programs suggest a need for developing training curricula and conducting in-service refresher trainings. These suggestions should be

extended to training teachers and cadres of the school health and nutrition supervisors. Third, development of transparent and robust performance evaluation systems with key performance indicators in the health care system is essential to improve individual performances and consequently organizational performance.

Increase Awareness on Nutrition. To help ensure nutrition messages reach all segments of the population, we recommend dissemination of these messages through various media, including cooking shows. followed by hands on counseling on key topics such a recommended IYCF practices, low cost high nutritional value meal planning, complementary proteins, portion sizes, carbohydrate counting etc. by trained health care workers can ensure messages reach all segments of the population.

Appendix 8: Situation and Gap Analysis for Sindh, with Proposed Priority Actions

The Food Security and Nutrition Strategic Review is an independent, analytical and consultative exercise designed to identify the key challenges faced by Pakistan in achieving food security and improved nutrition, and to provide prioritized areas for action for the Government of Pakistan and all humanitarian and development partners. In an effort to make the review an inclusionary process and better understand implementation efforts, the technical team from IFPRI and AKU held two consultative workshops in each province and region.

Facilitated by the Sindh Planning and Development Department, the consultative workshops held in Karachi, Sindh, were widely attended by members of government, local NGOs and United Nations officials. On January 26, 2017, the technical team also re-visited Karachi to present their conclusions to a similar stakeholder group.

In the first section of this appendix, we review the status of nutrition and food security in Sindh, beginning with an assessment of the nutritional status of children and its immediate and underlying determinants. This approach follows the structure in Chapter 3 in the main report, but focuses on the specific context of Sindh. The second section of this appendix presents gaps related to food security and nutrition, including gaps in food availability, food accessibility, WASH issues and policy, following the structure in Chapter 4. The third section of this appendix recommends a set of priority actions for Sindh, which follows the structure in Chapters 4 and 5 of the main report.

A.8.1. Nutritional and Food Security Status in Sindh

The main goal of this Strategic Review is to inform the government and stakeholders about the situation, gaps and recommendations related to improving nutrition and food security. The starting point is to assess nutritional status as reported in the UNICEF framework for children. We then look at the immediate determinants, including dietary intake and maternal health status. We broaden the review by looking at the underlying determinants of the nutritional status, including especially issues related to food insecurity.

A.8.1.1. Nutritional Status of Children

Table A.8-1 shows the main consequences for children from malnutrition, as reported in different data sources. Sindh lags behind the rest of the country across most measures, with almost half of children being stunted (48%) (MICS-Sindh, 2014). The level of both underweight and stunting is about 12% higher than the national average, based on PDHS 2013 data, and the level of wasting also is higher in Sindh. Infant and under five mortality rates are similar to the national average.

Table A.8-1: Anthropometrics/Mortality of Children Under Five in Sindh

	Sindh			Pakistan		
	NNS 2011	PDHS 2013	MICS 2014	NNS 2001	NNS 2011	PDHS 2013
Underweight	41	42	42	41.5	32	30
Stunting	50	57	48	31	44	45
Wasting	18	14	15	12	15	11
Infant Mortality	-	74	82	-	*78	74
Under Five Mortality	-	93	104	-	*94	89

Note: * Data from PDHS 2007

The time path of stunting, wasting and underweight proportions is instructive to view to show challenges that arise when attempting to improve children's nutrition. The situation derived from the MICS-Sindh 2014 shows that 28% of children are stunted *at birth*, more than 22% are wasted, and about 38% are underweight. Compromised maternal nutrition, along with poor IYCF practices, leads to increased children's malnourishment from 6 months until around 30 months, so that 60% of children are stunted, while wasting declines to 12%. The underweight prevalence worsens to about 48% at two years of age, but stays around the same average afterwards. After two years, the increase in stunting still occurs, but at a much lower rate. See Figure A.8-1. (MICS-Sindh, 2014).

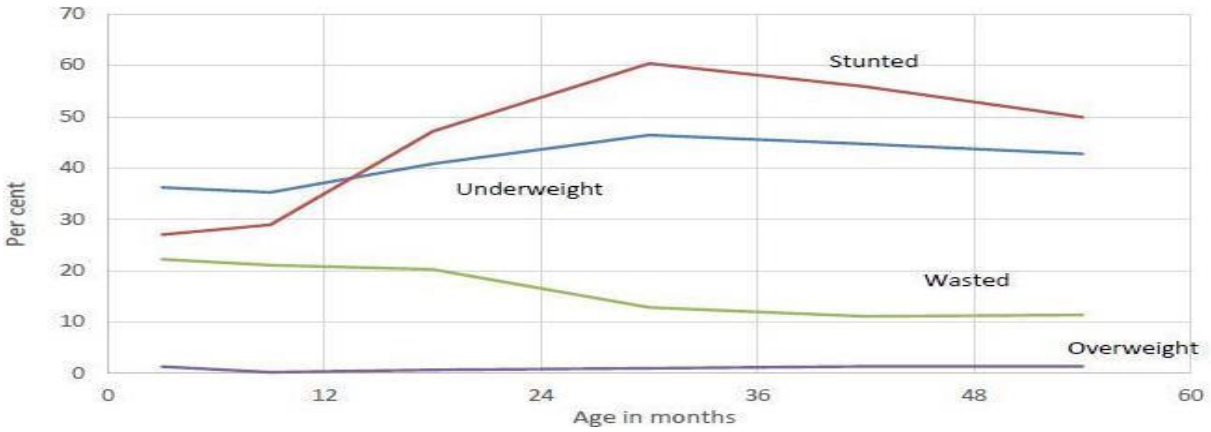


Figure A.8-1: Nutrition Status of Children under Five in Sindh (MICS-Sindh, 2014)

Additionally, severe micronutrient deficiencies exist among children, with vitamin A and iron most prevalent among children under five. As shown in Table A.8-2, 53% of children in Sindh are vitamin A deficient, 41% are iron deficient, 39% are zinc is deficient and 43% are vitamin D deficient. In the absence of adequate dietary practices, micronutrients requirements must be met with supplements. The PDHS 2013 notes that only 3.9% children aged 6-59 months received iron supplements in the last 7 days. Vitamin A supplementation was better, as 60% of children received a dose within 6 months. Malnourished children have higher risk of morbidity (both infectious and non-communicable diseases) and mortality. Moreover, these children have lower IQ and poor educational performance, physical

growth and development (Victora and Rivera, 2014). Therefore, the role of nutrition, combined with proper IYCF practices, is crucially important.

Table A.8-2: Micronutrient Deficiencies in Children Under Five in Sindh

	Sindh			Pakistan		
	NNS 2011	PDHS 2013	MICS 2014	NNS 2001	NNS 2011	PDHS 2013
Vitamin A	53			13	54	-
Iron	41			67	33	-
Zinc	39			37	39	-
Vitamin D	43			-	40	-

Sindh has 51% of early initiation of breastfeeding as well as the 10% of exclusive breastfeeding and both are standing above national average. However, pre-lacteal feeding is practiced by 49% of mothers, and bottle feeding has also risen, with 37% of children being bottle fed in 2014. The MICS-Sindh further 2014 shows that 36% of children are not introduced to semi-solid or solid foods at an appropriate age of 6-8 months. Only 6% of children under two are receiving a MAD, which is lower than the national average of 7.3%. Minimum meal frequency is also the lowest in Sindh (56%) as compared to other provinces and the national average. Research finds that pre-lacteal feeding is major barrier to early initiation of and exclusive breastfeeding and increases the risk of infections.

A.8.1.2. Immediate Determinants

The children's nutrition status presented above is affected by two immediate factors, including the mother's health status and the dietary intake within the family and by a child. These are discussed below.

Maternal Health Status. A mother's health status is an important determinant of children's health at birth and thereafter. Limited maternal nutrient reserves lead to intrauterine growth retardation, as 80% of an infant's iron and zinc stores are accumulated in the last trimester of pregnancy. Furthermore, compromised maternal nutrition affects the composition of breast milk, as many nutrients are secreted in human milk at the expense of maternal reserves, especially micronutrients such as vitamins B_6, B_{12}, A, and D. This is reflected in the malnutrition indicators for Sindh with 27% children already stunted, 22.2% wasted and 36.2% underweight by the age of 6 months (MICS-Sindh, 2014). Widespread micronutrient deficiencies are found among pregnant and non-pregnant women across Sindh (NNS, 2011), with vitamin D deficiency most prevalent. Table A.8-3 shows some differences in micronutrient deficiency levels between non-pregnant and pregnant women, especially for vitamin A and zinc. These deficiencies can translate into growth problems in unborn children.

Table A.8-3: Maternal Micronutrient Deficiencies in Sindh

	Vitamin A (Both Severe and Moderate)		Vitamin D		Iron		Zinc	
	Pregnant Women (%)	Non-Pregnant Women (%)	Pregnant Women (%)	Non-Pregnant Women (%)	Pregnant Women (%)	Non-Pregnant Women (%)	Pregnant Women (%)	Non-Pregnant Women (%)
Pakistan NNS - 2001	-	6	-	-	-	45	-	46
Pakistan NNS-2011	46	42	69	67	25	19	48	41
Sindh NNS-2011	47	35	71	67	35	32	45	39

Dietary Intake. The prevalence of undernourishment in Sindh is slightly above the national average, at 22%. However, 51% of households in Sindh have average food consumption lower than 2,350 kcal per adult equivalent per day. Despite the general availability of nutritious foods in markets and the high levels of urbanization in the province, Household Dietary Diversity Scores reveal that 44% of households consume from fewer than five food groups, and 70.8% of households are below the staple adjusted nutrient threshold (GoP and WFP, 2016a; GoP, 2017). Moreover, data show that a high proportion of total food expenditure goes to wheat, oil, fats and sugar, which are energy dense but of low nutritional value, thus making the lack of dietary diversity more problematic. Resultant food-based micronutrient inadequacies include vitamin A (89%), iron (77%), zinc (40%) and protein (43%), as shown in Table A.8-4 (GoP, 2017).

Table A.8-4: Inadequacies in Caloric and Micronutrient Intake in Sindh (GoP, 2017)

	Diet Quantity			Under-nutrition			
	Average per capita kcal consumption	% of HH below 2350 kcal per adult equivalent per day	Prevalence of under-nourishment (PoU)	% of HH with food based micronutrient deficiencies			
				Protein	Vitamin-A	Iron	Zinc
Pakistan	2,360	44	18	32	77	68	40
Sindh	2,229	51	22	43	89	77	40
Hyderabad	2,277	49	24	41	94	83	68
Karachi	2,127	57	33	46	87	75	31
Larkana	2,262	48	23	48	88	84	41
Mirpur Khas	2,248	50	23	57	96	63	50
Sukkur	2,279	47	17	31	86	79	13

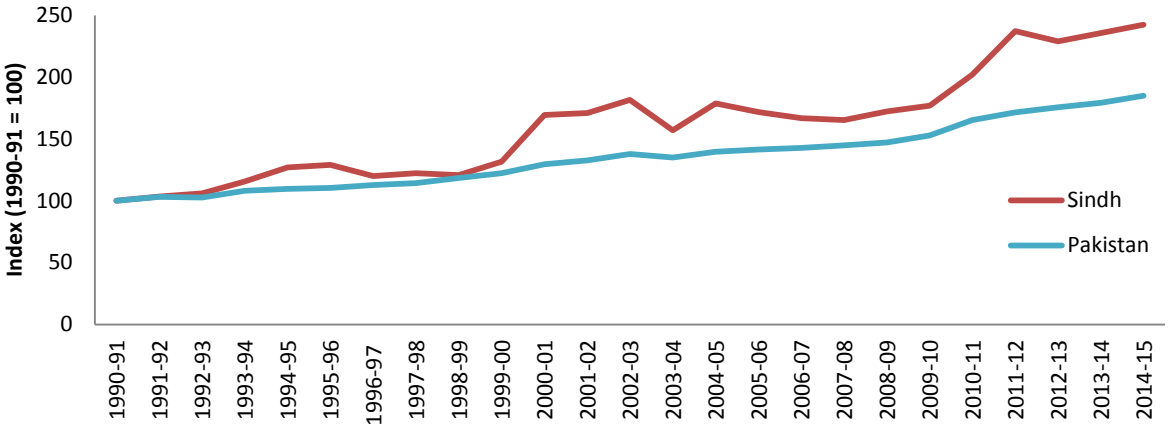
A.8.1.3. Underlying Determinants

In this section, important underlying determinants are reported, including availability and accessibility of food, WASH factors and the role of selected policies.

Food Availability. During the last 25 years in Sindh, crop yields per acre of land had to increase by 142% to maintain the same per capita food availability over time (GoP, 2014b), which is much higher than the

required national increase of 85%, as Figure A.8-3 shows. This significant difference from the national average is likely due to the large increase in Karachi's population. The population to be supported on each acre is expected to further increase by 29% from 2015 to 2030. However, Table A.8-5 shows that crop yields do not kept up with the provincial population growth (2.3%), and in fact the yields for fruit production has declined by 0.6%. While it is possible to rely on imports rather than domestic production, unlocking productivity in agriculture is essential to reduce the cost of a nutritious diet, to allow labor to transition into industry and higher-level services, and to permit scarce government revenues, currently used for subsidies, to be shifted to higher payoff uses.

Figure A.8-3: Population Pressure on Cultivated Land Area in Sindh



Source: Agriculture Statistics of Pakistan (Various Issues) and Population Estimates from Population Census, 1998.

Table A.8-5: Crop Yield and Population Growth Rates in Sindh

	Wheat	Rice	Maize	Sugarcane	Pulses	Vegetables	Fruits	Population*
Sindh	1.5	1.3	1.9	0.6	0.6	0.7	-0.6	2.3
Pakistan	1.1	1.1	1.2	0.4	0.9	-0.6	-0.3	2.5

Source: Agriculture Statistics (Various Issues) and Economic Survey of Pakistan, 2013-14
* The 34-year population and crop yields growth rate from 1981 to 2014 is sourced from Economic Survey of Pakistan, 2015-16 and Agriculture Statistics of Pakistan (Various Issues).

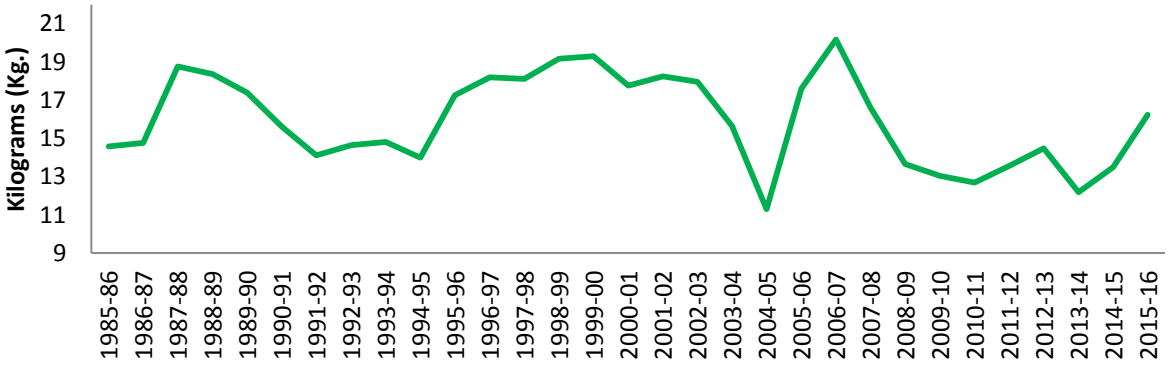
Food Accessibility. With the second highest incidence of multidimensional rural poverty at 75.5%, the intensity of poverty in Sindh has been on the rise since 2010. In addition, out of the eleven districts throughout Pakistan where poverty has increased since 2004, five[40] are situated in Sindh (GoP, 2016a). Moreover, 71% of the households in Sindh are unable to afford a balanced (staple adjusted) nutritious diet given their current levels of food expenditures (GoP and WFP, 2016a).

Household real incomes have remained stagnant in Sindh since 2001 in both rural and urban areas and also across quintiles (GoP, 2014a). With regard to daily wages, while the nominal daily wage of unskilled labor in Karachi increased between 2004-05 and 2015-16, there were large fluctuations in food

[40] Umerkot, Kashmore, Tando Muhammad Khan, Tando Allahyar and Tharparkar.

affordability due to the year-to-year food price volatility, as shown in Figure A.8-4. An unskilled laborer in Karachi could afford about 20 kilograms of wheat with a daily wage in 2006-07, but could only afford about 13 kilograms in 2009-10 (GoP, 2016b). Since 2014, there is an improving trend.

Figure A.8-4: Kilograms of Wheat Flour Affordable per One Day's Wages in Karachi



Source: Economic Survey of Pakistan (Various Issues)

On the physical accessibility front, though Sindh has made large improvements over the past five decades in terms of expansion of roads, transportation and communication networks, some areas of the province are still remote (Kedir, Schmidt, and Waqas, 2016). Village electrification has increased, yet the inconsistent supply of electricity remains an issue, especially in rural areas (PRHPS, 2017). The rate of urbanization in Sindh is 4.1%, as compared to the national average of 3.6%.

WASH Issues. Almost 60% of the population has access to both improved (mostly covered) water sources as well as improved sanitation facilities. However, 20% of the population overall, and as high as 50% in Mirpurkhas Division, still practices open defecation (MICS-Sindh, 2014). Availability of adequate infrastructure and sanitation facilities in schools is poor, as only 23% of schools have basic water, sanitation and infrastructure facilities, as compared to 93% in Punjab and 53% nationally (Alif Ailaan, 2016).

Policies. Significant steps have been taken in drafting nutrition-support and food security policies in Sindh, particularly since the 2010 floods and the federal establishment of the PINS. In addition to approved laws and policies, some major policies also are in draft stage. The draft Sindh Sanitation Policy awaits approval, and initial discussions have begun on the Sindh Agriculture Policy. The status of several relevant Sindh laws and policies is summarized in Table A.8-6.

Table A.8-6: Polices in Sindh

Policy	Year	Details
Protection of Breastfeeding and Child Nutrition Act.	2013	Endorsed in Sindh.
The IDD Control Bill	2013	Implementation is poor
Multi-Sectoral Nutrition Strategies and PC-1s.	2015	Drafted within the scope of Pakistan Vision 2025.

A.8.2. Gaps in Food Security and Nutrition

The three days of provincial consultations along with an in-depth desk review highlighted a series of gaps and challenges hindering progress in achieving food and nutrition security in Sindh. These gaps are presented in three subsections below. The first subsection indicates gaps related to both nutrition and food security. The next subsections present gaps specific to food security, followed by nutrition.

A.8.2.1. Gaps Related to Both Food Security and Nutrition

Policy and Governance Gaps. Most relevant policies in Sindh are very recent and need time to have impact. The Protection of Breastfeeding and Child Nutrition Ordinance was passed nationally in 2002, but only adopted 11 years later in Sindh (in 2013) followed by notification of the Sindh Infant Feeding Board in 2014. Despite of these efforts, exclusive breastfeeding rates remain low, while early initiation of breastfeeding has declined. Other examples include the enactment of the Compulsory Salt Iodization Act, 2013, but weakness in market quality assurance of iodized salt continue, as evidenced by MICS-Sindh (2014) data showing that only 36% of households consume adequately iodized salt.

Writing a policy does not ensure impact. For any policy to be successful, adequate funding is needed, as is a structure to mobilize, evaluate, and redirect funds. Additional challenges for policy implementation include the need for technical human resources and systems for monitoring and evaluation; making sure that diverse stakeholders are included; and securing investments from the private sector.

Funding Gaps. Stakeholders in Sindh consultation meetings raised as a major concern the limited funding from government and reliance on donors for nutrition-specific and nutrition-sensitive programs. Other concerns regarding funding modalities included the population-based distribution formula, which led to inequitable funding allocations, depriving districts most in need. Sindh spends as much as PKR 50 billion each year on direct and indirect agricultural subsidies, but much of these funds could go to better uses in nutrition or productivity-enhancing investments.

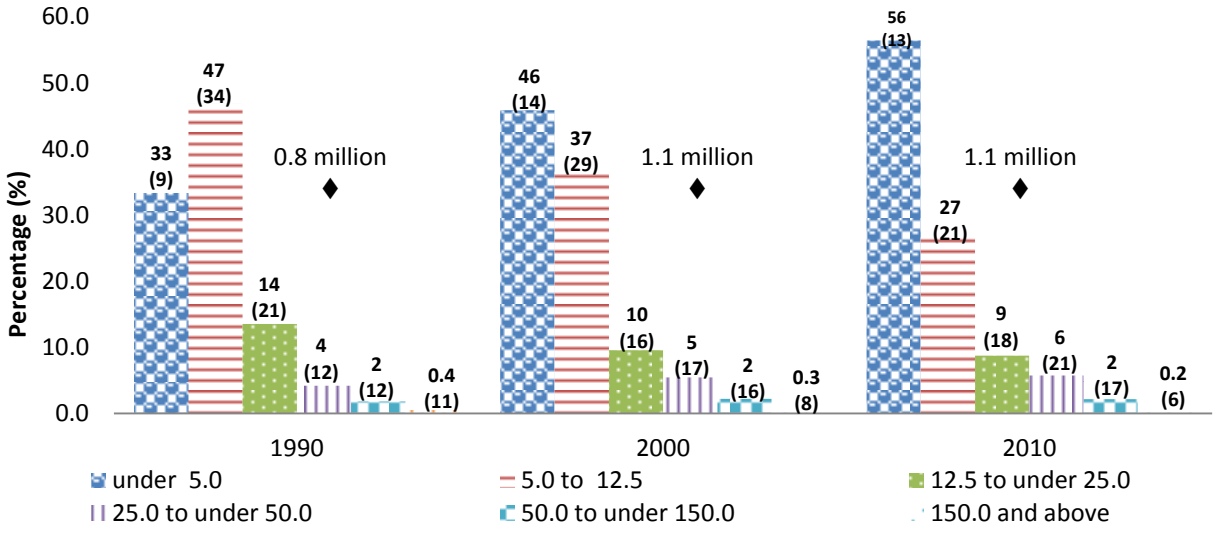
Accessibility Gaps. Despite an adequate food supply in Sindh, a lack of affordability hinders food security. Real incomes in the lowest quintile have risen at a much slower rate than incomes in the highest quintiles, so a balanced diet remains out of the reach of almost 83% of rural households, given their current food expenditures (GoP and WFP, 2016a). Any economic growth in Sindh has not been inclusive or equitable. As in most of rural Pakistan, a lack of rural non-farm employment opportunities in the province, and the resultant urban migration, poses a serious concern for the already difficult food security situation. In the absence of affordability, social protection plays a key role. While many social protection programs[41] are underway, they clearly fall short, given that half the population in Sindh faces multidimensional poverty.

[41] For this provincial discussion, we do not address national social protection programs, such as the BISP, as the gaps and recommendations are similar across provinces and have already been covered in the main report.

A.8.2.2. Gaps Specific to Food Security

Availability Gaps. Possibly the most critical issue for food availability in Sindh is the increasing number of farms with less than five acres of land, which makes agricultural productivity highly challenging. Figure A.8-5 shows the change over time in the percentage of farms of various sizes. In 1990, one-third (33%) of farms in Sindh were less than five acres in size, but as of 2010 about 56% of farms are in this smallest category. Most of the small farm acreage is coming from fragmentation of mid-sized farms, which fall in the small commercial farmer category. (In 1990, there were about 0.8 million farms in Sindh; this number grew to 1.1 million in 2010 due to fragmentation.) This fragmentation is a concern because small commercial farmers have a significant role in productivity growth and poverty reduction. (See Chapter 4 for a detailed discussion on work by Mellor and Malik, 2017.)

Figure A.8-5: Declining Farm Size over Time in Sindh, in Acres



Source: Agriculture Census (Various Issues)
Note: Numbers in parentheses show percentage of total acreage

For sustained agricultural production, traditional inputs cannot be the engines of growth, as land, tube wells, water, and even fertilizer and tractors have reached their maximum contribution. While the use of indigenous improved seed has been growing, it is costly, often unavailable, and inconsistent in quality. With the growing number of small farms and input use saturation, advancements in agricultural R&D are crucial, but spending on R&D remains low in Sindh, as in the rest of the country. Other issues that challenge agricultural production in Sindh include climate change, marketing and distribution, and long-run sustainability. These issues are discussed in detail in Chapter 4 and do not vary significantly by province.

A.8.2.3. Gaps Specific to Nutrition

Absence of Nutrition-sensitive Schemes for WASH. A recent analysis suggests that only about one-quarter of stunting could be alleviated by nutrition-specific interventions alone, which indicates that the

potential role of WASH might be significant (Bhutta et al., 2013). Sindh has made good progress in increasing access to improved drinking water sources (91%), which has a range of benefits, including time and energy savings for women and children, and lower diarrhea prevalence (Cumming and Cairncross, 2016). However, the majority of households (87%) do not treat water, and poor water quality is particularly an issue in urban areas. In addition, while 65% of households have access to sanitation facilities, open defecation and sub-optimal WASH conditions in schools adversely affect the nutritional status of children. These factors contribute to school absenteeism and high drop-out rates, especially among girls during menstruation.[42] School drop-out rates among girls are associated with early marriages and motherhood in adolescence, thus initiating an intergenerational cycle of stunting and poverty. Creative solutions are needed for WASH investments that help nutrition.

Program Implementation Gaps. CMAM programs are confined to limited districts within Sindh and have patchy coverage and no link with mainstream government programs or the health care system. In remote districts, the availability of human resources to deliver the program is an issue, and referral rates remain low. In addition, CMAM is cost-intensive when imports of RUTF are used, before local alternatives are devised. Despite varying models of school health programs being implemented, little progress has been seen in health indicators or adoption of health seeking behaviors, so a successful and sustainable model with a nutrition package is yet to be developed. Among the 5 districts covered in the MICS 2014 for Sindh, the three with the highest estimated number of severely underweight children are in Karachi (about 91,000), followed by Hyderabad and Mirpurkhas each of which have about 62,000 severely underweight children each. Together, these three districts cover over 78% of the SAM afflicted children in the five MICS districts, so this form of malnutrition still exists even in Sindh.

Stakeholders in Sindh highlighted as a challenge the limited coverage by LHWs, particularly in suburbs and slums. Only 36% women aged 15-49 reported being visited by a LHW in the past three months (MICS-Sindh, 2014). In addition, integration of LHW services with BHUs is uneven due to weak referral systems. Other issues included weak logistics and lack of separate adult and baby weighing scales. Moreover, process evaluations during programs and impact evaluation after programs are limited. Those programs that were evaluated did not effectively embed findings in scaling-up plans.

Lack of Awareness on Nutrition. The literature consistently suggests that education and nutritional awareness among women plays a vital role in determining the dietary practices of households. Data from a plethora of nutrition-focused surveys confirms that nutrition indicators improve with increasing maternal educational levels, as well as wealth quintiles. Low literacy levels coupled with media influences and cultural beliefs/taboos (such as beliefs that fortification/polio vaccines cause impotency, or that hot and cold foods should be consumed for certain illnesses) adversely affect dietary practices. The situation is amplified by an absence of nutrition concepts in school curricula and teacher induction programs. During the consultations, participants expressed a common concern that most nutrition programs lack effective BCC strategies, contributing to low exclusive breastfeeding rates (10%) and high

[42] http://documents.worldbank.org/curated/en/576391490881393712/pdf/113884-WP-PUBLIC-ADD-SERIES-Water-and-sanitation-program.pdf

pre-lacteal feeding (49%) in the province. Community mobilization also is limited when designing nutrition interventions.

Human Resource Gaps. To achieve improved nutrition in Sindh, the health care system as well as the development sector should have human resources with credible nutrition expertise. At present, there is limited capacity among existing health care providers in nutrition, and a dearth of nutrition experts in the development sector. One reason is that nutrition is not given enough emphasis in medical curricula and in-service training. Stakeholders pointed out that performance appraisals, refresher trainings and supportive supervision are lacking. These problems are exacerbated by irregular disbursement of salaries, which adversely affects motivation levels and leads to underperformance among health care workers. In addition, stakeholders noted that rapid turnover of management in nutrition programs hinders effective leadership.

A.8.3. Priority Actions for Food Security and Nutrition

This section presents recommended action items for improvements in food security and nutrition in Sindh. The first subsection relates to national recommendations that require provincial support. The next subsections present priority actions related to both food security and nutrition, followed by specific recommendations related to each topic separately.

A.8.3.1. National-level Recommendations that Need Provincial Support

The following general and overarching actions, highlighted in the main report, should be part of all programs or policy developments, and should be supported and implemented by stakeholders in Sindh:

- **Establish a nutrition and food security surveillance system**, in line with SDG targets and indicators, and ensure its data requirements are met. The NNS 2011 and MICS 2014, for example, missed nutritional data on adolescents due to over-reporting, poor recording, high refusal rates, low bioavailability due to dietary practices and interrupted/inadequate supply of supplements.
- **Create of a culture of monitoring, evaluation and research** that helps define how to implement and scale up potentially valuable programs.
- **Identify and empower female champions for change** at the household and community levels in all programs and implementation structures, including microfinance for women and interventions that bring positive change for women in the household power structure.

Additionally, a set of analyses, policies, and programs appropriate to most provinces and regions are presented in Chapter 5 and are summarized briefly here.

- **Evaluate current social protection programs** for potential coverage, costs and likely benefits, with nutrition sensitive components added whenever they can be effective. While universal social protection is perhaps a long-term goal, immediate challenges are to reach the urban poor and landless rural inhabitants. This review could examine if awareness programs within BISP, increasing payments, and graduation programs are effective to improve outcomes.

- **Finalize policies** under review at the national level **and implement them fully** through the provincial government and other stakeholders. These include a National Water Policy, which has been drafted; a National Seed Amendment that was passed in 2015; and a Plant Breeder Rights Act in 2016. The implementation of these policies has been slow.
- **Conduct comparative analysis of best approaches for BCC strategies** related to nutrition, particularly for breastfeeding campaigns, as current programs show little long-term effect. Analysis is needed of the value of broader nutrition campaigns and the potential use of community social structures for promoting nutrition knowledge. BCC strategies also should include mechanisms to sensitize males on women's health issues.
- **Review the role of BHUs and other locations for SNF delivery** (particularly since SNF programs are not a top option economically – (Shekar et al., 2016)); assess the feasibility of integrating CMAM programs into the community-based health care delivery system; and enhance capacity of LHWs and BHU doctors to screen for acute malnutrition.
- Assess the potential for schools to **add basic nutrition education and WASH concepts in teacher training programs,** and assess the expected nutritional impact of improving WASH facilities in schools and other locations to identify those that are most cost-effective and have the highest impact on nutrition outcomes.

A.8.3.2. Priority Actions Related to Both Food Security and Nutrition

In this section, we offer recommendations related to both food security and nutrition in Sindh.

Further Improve Institutional Arrangements. The MSNS and associated institutional structures have been developed well in Sindh, with the strategy completed, cells created and integrated PC-1s put in place for funding. However, as these systems are new, they must be given time to bear results, and all interested stakeholders should observe and track this progress. Specific suggestions include the following:

- **Review proposed projects for gender-sensitive and nutrition-sensitive components**. The related nutrition cell in the provincial P&D department can take the lead. Conducting such reviews for all proposed projects would improve the gender and nutrition dimensions of projects implemented by all related departments.
- **Assess the administrative homes for MSNS**. In many respects, the location of the management of the MSNS in the P&D department is correct, given the multi sectoral dimensions of the strategy. Depending on outcomes after several years, however, in order to gain further political commitment for nutrition and food security, it might be advisable to move the administrative home of MSNS to the Chief Minister's office.
- **Assess the food security-related departments in the MSNS** to determine whether their structure is adequate.

Explore Funding Options. Sindh may spend about PKR 50 billion each year on direct and indirect subsidies through wheat procurement, fertilizer, and credit. (The costs of the irrigation system are over and above this amount). The required funds for food security and nutrition initiatives can be found by diverting such subsidies to nutrition-focused and/or productivity-enhancing agricultural R&D, in part by

better targeting of subsidy beneficiaries. In addition, imposing an agricultural income tax and revenues from sales of public research products can provide long-term support to the agricultural sector.

A.8.3.3. Priority Actions Specific to Food Security

This section presents action items specifically for improving food security in Sindh.

Encourage Small Commercial Farms.[43] For sustained agriculture-led, inclusive growth and ensured food availability, Sindh should enable and support small commercial farms. These farms can adopt new technology better than smaller farms, and can demand rural non-farm goods in greater proportions, thereby helping poor non-farm households in rural areas through this demand. Currently over 80% of the country's agricultural income is derived from such small commercial holdings. With correct incentives, small commercial farms could help pull Sindh away from dependency on tenant farming.

Enhance Fishing Industries. The fisheries sector in Sindh is unique within the country in many ways. It can make use of coastal waters, mangrove swamps, other delta waters, and inland waterways and ponds. A functioning fishing industry currently exists in Karachi. It would be useful to evaluate the existing practices within the fisheries sector in Sindh, and assess the potential for development of enhancing the local industry through public-private partnerships. Also an enabling environment can encourage value addition and growth, and modern marketing practices can help realize the export potential of the sector.

Capitalize on Competitive Advantages. Sindh's seasonal patterns and other competitive advantages provide significant opportunities. Many high-value products can be grown and marketed in cities throughout the province. Additionally, the province's private sector is highly developed, providing opportunities for public-private initiatives. The government should be an active player to help direct these developments so that they reach smaller farms, which have the greatest effect on food security. Progressively, the private sector should take over, but it need to be determined when and in what areas. While there are numerous options, one potential approach is to create an Agricultural Marketing Regulatory Authority to shift the government to a more regulatory role for agricultural marketing, and to encourage more engagement from the private sector, as is being attempted in Punjab.

Adopt and Enforce Relevant Policies. Sindh has an agricultural policy under development, with a Technical Working Group established to ensure that the policy is developed and followed through to implementation. It is important that policy should have some type of Commission with the capacity to provide oversight for policy implementation, the right composition of stakeholders included, independence to act, and technical capacity to design associated legislation and supporting programs. The policy needs to be finalized and should facilitate an appropriate balance between accessibility and availability, which is often not the case. The policy also needs effective implementing structures and associated PC-1s.

[43] Defined formally, a small commercial farmer produces sufficient output to exceed the poverty level but not enough to take on import and capital-intensive urban consumption patterns. Research suggests that it takes 1.4 acres of land (average farm size of under 3 acres) to enable a family of six to meet poverty line expenditures.

Enhance Agricultural Research. Sindh has not put in place enabling legislation for a provincial agriculture research board. This board has the potential to link research institutions, extension workers, rural development associations and farmers, and to support public private partnerships. It would be an important addition to agricultural development approaches in Sindh.

Explore Other Suggestions. Many additional ideas were proposed during the consultations, including: Index-based crop and livestock insurance schemes; ICT-based mapping and zoning of agriculture; cluster-based approaches to agriculture; credit facilities; improved livestock vaccination systems through cold boxes; milk collection centers; and better genetic potential of indigenous livestock.

A.8.3.4. Priority Actions Specific to Nutrition

Adopt and Enforce Relevant Policies. Recommended actions specific to nutrition in Sindh include adoption and enforcement of the following key policies to track, review and promote nutrition outcomes:

- *Protection of Breastfeeding and Child Nutrition Act.* This law was passed federally in 2002, but not endorsed by Sindh until 2013. The law must be translated into tangible implementation actions.
- *Salt Iodization Acts***.** Sindh adopted salt iodization in 2013, but implementation of this policy is poor. Development of strategies to ensure successful implementation are necessary.
- *Food Fortification Acts***.** Mostly donor-related efforts have been made for food fortification, through GAIN and MI, and Sindh mandated oil fortification through the Pure Food Rules of 1965. Legislation for fortified wheat flour is needed, with mechanisms for quality assurance and cost reductions by food processors.
- *Early Marriage Restraint Act***.** Sindh is the only province to pass the Early Marriage Restraint Act in 2013 to prevent early marriage, before the age of 18. Strict enforcement of the law will help ensure delays in marriage, thereby preventing adolescent mothers from entering the intergenerational cycle of stunting and poverty.

Improve Program Implementation. Research should inform the design of nutrition programs that are context appropriate, gain community acceptance, and meet actual community-level needs. Also needed are process evaluations and M&E systems with periodic cross-cutting reviews of funds, as well as measurable indicators and time-bound goals to create accountability. These systems will help determine feasibility and identify bottlenecks for full-scale implementation. A web-based knowledge management portal for nutrition should be considered, with all information accessible needs to promote lessons learnt, identify best practices, and avoid duplication of efforts.

A CMAM program aimed at eliminating severe malnutrition in the three districts with the highest number of severely underweight children (Karachi, Hyderabad and Mirpurkhas) using the full range of CMAM intervention (estimated to cost PKR 39600 per person - UNICEF, 2012) would cost a total of PKR 8.5 billion. If the next two districts with the highest number of severely underweight children (Larkana and Sukkur) are included, the cost goes up to PKR 11 billion. These costs are manageable when compared with the total amount spent in Sindh on direct and indirect subsidies of perhaps about PKR 50 billion. Ultimately, these costs could drop by using a lifecycle approach to nutrition, progressively seeing

adolescents as the first point of intervention, followed by pregnant and lactating women, which is needed to stop the intergenerational transmission of poor growth and development in children. CMAM programs with built-in compliance monitoring at schools can be very effective. Furthermore, horizontal integration of such programs, supported by community mobilization, could help ensure that marginalized segments of the population are reached. The MSNS can link these programs with school monitoring.

The LHW program is a potential resource for identifying those at risk and integrating CMAM programs into the health care system. Enhancing the capacity of frontline health workers (LHWs CHWs, LHVs and Medical Officers at BHU/RHC) for screening for acute malnutrition, counseling parents and dispensing SNF can increase coverage and ensure effective treatment of SAM and MAM on an out-patient basis.

Develop Human Resources. We recommend creation of dedicated nutrition positions in programs and hiring of qualified nutrition experts. To achieve these goals requires long-term human resource development initiatives. First, curricular standards and requisites on nutrition competencies need to be established and made a mandatory part of medical education and training as well other academic courses. Second, evaluations of existing nutrition-related community programs suggest a need for developing training curricula and conducting in-service refresher trainings. These suggestions should be extended to training teachers and cadres of the school health and nutrition supervisors. Third, development of transparent and robust performance evaluation systems with key performance indicators in the health care system is essential to improve individual performances and consequently organizational performance.

Increase Awareness on Nutrition. To help ensure nutrition messages reach all segments of the population, we recommend dissemination of these messages through various media, including cooking shows. followed by hands on counseling on key topics such a recommended IYCF practices, low cost high nutritional value meal planning, complementary proteins, portion sizes, carbohydrate counting etc. by trained health care workers can ensure messages reach all segments of the population.